

ECONOMIC GROWTH STUDY DESIGN

CITY AND COUNTY OF SAN FRANCISCO

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GROWTH IMPACT STUDY
DESIGNS AND INFORMATION



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ECONOMIC GROWTH STUDY DESIGN
City and County of San Francisco

FINAL REPORT: GROWTH IMPACT
STUDY DESIGNS AND INFORMATION

Report to the Department of City Planning
San Francisco November 1973
Berkeley Planning Associates SFG-3

FOREWORD

This final report to the City Planning Department of the City of San Francisco culminates our attempt to impose a modicum of order on the growth issue as it affects San Francisco, and to find in the topic those questions that might be amenable to further investigation. Preliminary designs for carrying out those investigations constitute the core of this report. Not surprisingly, the growth issue touches on almost every aspect of the City's life, and answers to the complex puzzles presented here are mostly a long way off. There is much that can be learned, however, and we have tried to suggest how to begin.

Two working papers preceded this report: "A Critical Review of Existing Growth Studies and Literature Related to Growth and Its Impacts," (June 1973) approached the growth question from the standpoint of the existing research literature and previous studies; "Issues and Questions Related to Growth," (September 1973) was based partly upon key informant interviews and tried to structure and evaluate the components of the issue. These reports provide supplementary material to the final report, but are not essential to its understanding.

A number of people have contributed significantly to the results of the study. Members of the City Planning Department -- notably Allan Jacobs, George Williams, and Peter Svirsky -- as well as other City officials and civic leaders, have commented upon earlier reports and previous drafts of this one. Peter Groat acted as the Planning Department's liason, and his conscientious efforts to provide substantive information as well as keep the project on its path are greatly appreciated. During the final phase, James Maresca and James Sundberg did most of the field work and a large share of the study design and report preparation; their association with the project provided a depth and detail that would not have been achieved otherwise.

Douglass Lee
Project Manager

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Economic growth study
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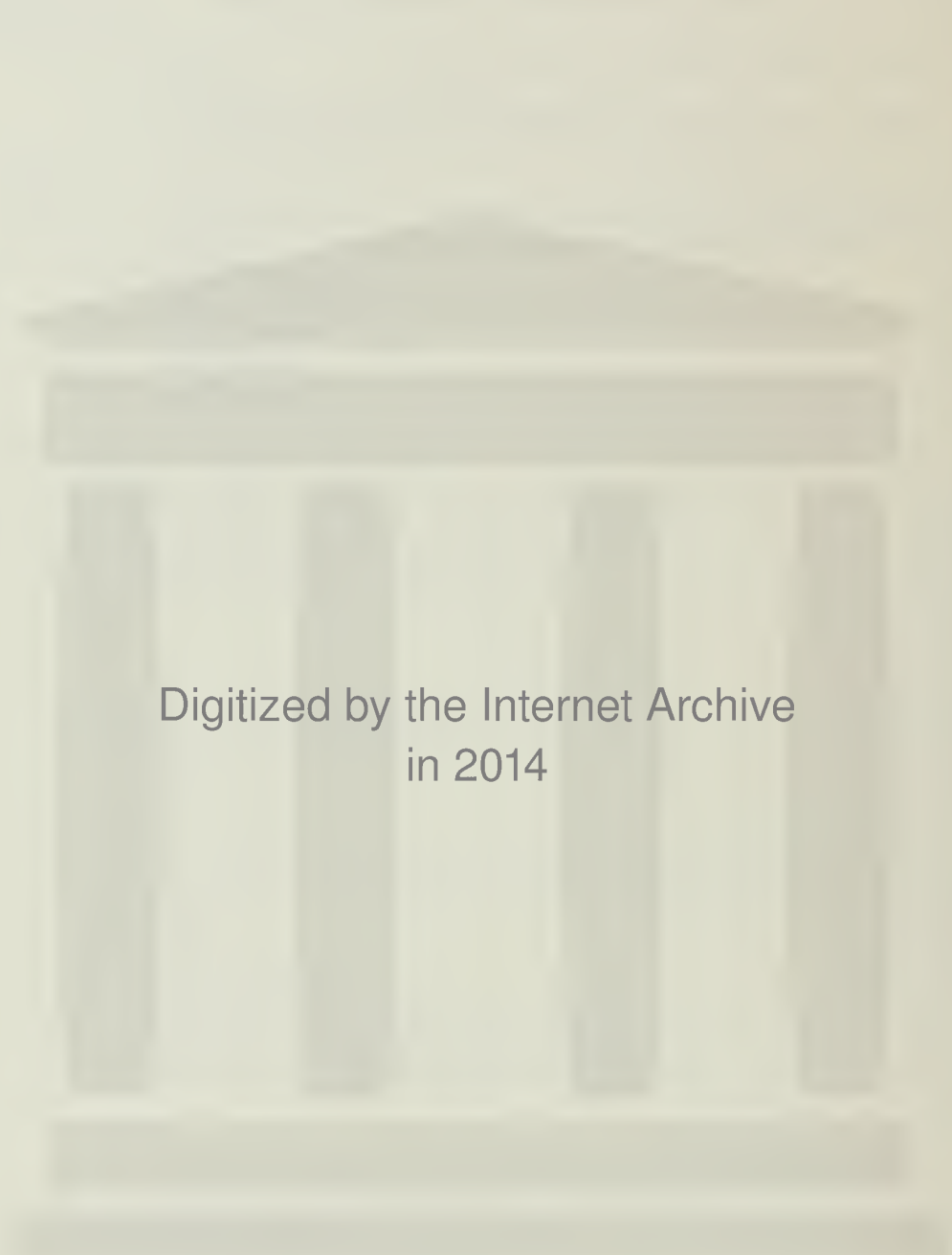
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I. INTRODUCTION



NATURE OF THE ISSUE

The clearest thing about growth as an issue is that the issue is very unclear. Too much growth may be a worry in some instances, while too little or negative growth may be the concern in other circumstances. Issues such as the desirability of highrise buildings may not start out as growth issues, but eventually reach that impasse. Sometimes the growth issue is adopted as a cover for a different hidden agenda (e.g., an attempt to escape from a tax burden), while at other times a question that is inherently growth-related is not identified as such. The complexity of the issue is enormous, and this report is an attempt to begin sorting out the components of the growth issue and to encourage analysis and collection of information that will enlighten public debate about the subject.

An initial step is to recognize that a great deal of self interest pervades the discussion. People do not like to have change forced upon them --especially when they like things as they are-- and stopping growth is often an attempt simply to stop change. Certain sectors of the economy that depend upon a steady stream of new capital investment --residential and commercial construction for example-- strenuously object to any moratoriums on growth or development. Some population groups view growth as the only means by which they can exert their claims for a larger share of the income and wealth generated by our society, while other groups see growth control as a way of protecting their hard-earned achievements in this regard. Business booster groups continue to extoll the virtues of growth, and conservationists continue to rail against destruction of the natural environment.

On the other hand, there is much more to the growth issue than simply a competition between economic or demographic groups for a higher place on the ladder. Certainly there are many resources, including natural resources such as air and water, that are scarce and have been undervalued in the past, leading to our treating them as if they were cheap when in fact they are not. Certainly some members of the population have benefited at the expense of others, even though it may be hard to determine which is which. Whether necessarily related to growth or not, a city needs to be concerned with its industry, employment, population, housing, transportation, etc; it should know what is happening, what is likely to happen, and --to the extent feasible-- why. Although our ability to understand these things is very limited at the present time, much that is known is not used; and much more can be known with the application of a little effort.

SOME DISTINCTIONS

In the process of trying to organize thinking around growth topics, a number of conceptual distinctions have been useful. Rather than being refined and precise definitions, these distinctions represent rough slices at the underlying dimensions of growth-related issues.

Economic and Demographic Growth

A natural division occurs between things that portray the economy (jobs, capital investment, industrial mix) and things that refer to the population (number of people, age and ethnic characteristics). Some attributes (housing, labor force participation) relate to both economic and demographic concerns, and obviously the two aspects are highly interrelated, but the distinction is still a helpful one to make.

Geographic Focus

Three levels of geographic scope can be delineated: region, city, and neighborhood. Regional questions involve the growth of the Bay Area as a whole and the redistribution of population and economic activity within the region; San Francisco is simply one part of the overall picture, but may contain concentrations of functions and populations that have a regional market area. City-wide issues involve the aggregate growth or decline of activities and populations within the City, and the shift from one set of industrial or population types to others. At the smallest geographic level, different issues are of concern to different neighborhoods, and these may run completely counter to each other and to the interests of the City or the region as a whole.

A representation of this distinction in relation to different issues is offered in Figure 1. Patterns of industry and employment are of major concern to the City, but depend to a great extent upon economic attributes of the rest of the region, and hence must be analyzed in that context. Tourism, as a specific industry, is much more localized in San Francisco, at the City-wide level. Manufacturing is both regional and local, but probably of lesser importance to the City than tourism, for example. Regional patterns of population growth are of some interest to the City, particularly as it affects the distribution of demographic characteristics within the City, but aggregate population

growth within the City is not of critical concern since at present it is negative; in the neighborhoods, however, population growth may be very much a concern.

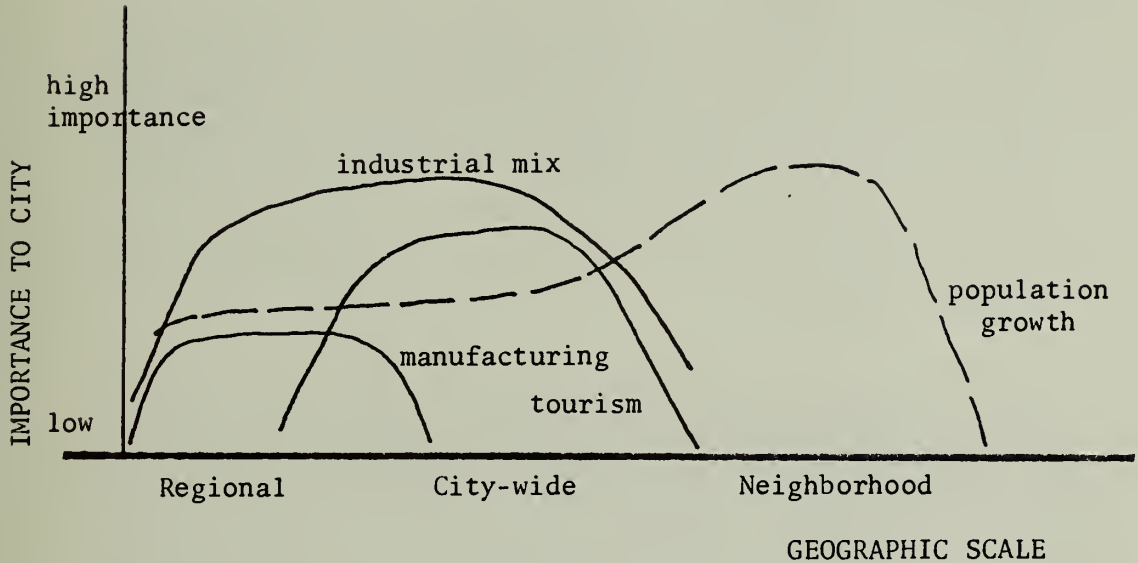


Figure 1. Importance of Issue versus Geographic Level

Stocks and Flows

Some aspects of the City can be thought of as having an absolute measurable size at any specific point in time: the number of jobs, the value of capital investment, the number of workers, the number of people, the number of dwelling units, etc. These units of measure relate to "stocks" or accumulations of something, and in turn have other attributes: industrial category, payroll, skill level, occupation, sex, age, number of square feet, for example. Thus stocks have some amount or level at any given moment in time.

Flows refer to changes in stocks over time. Families migrate into the City and other families move out; some housing is demolished and other units constructed; new offices and jobs are added

to their stocks, and others may be subtracted; residents employed in the City decline and are replaced by commuters. In some cases it is the absolute amount or distribution of that amount--the stock-- that is most relevant, while the direction and rate of change -- the flows -- may be of more interest in other contexts.

Sectors and Industries

For purposes of collecting and tabulating data, economic activities are classified into groups of similar types, using a hierarchy with several levels. The Standard Industrial Classification (SIC) code is the major example, but there are also other ways of categorizing economic activities. Ideally, an industry is a group of firms that produces products or services that are relatively homogeneous; whatever the level of aggregation, firms in the same industry are more alike in their outputs than firms in different industries.

In reality, firms produce a wide variety of outputs that generally differ significantly from one firm to another, and many firms produce several kinds of outputs. Hence any classification scheme is only an approximation, and any specific classification has limited flexibility for different purposes. Tourism, for example, is difficult to study both because the industry categories are not designed to delineate tourism and because tourist services are often joint products with non-tourist services in the same firms. The analyst is then faced with the choice of making rough guesses from secondary data or collecting new information.

Sector is a term that is somewhat broader than the term industry. A sector may be an aggregation of industries (in which case there is a good deal of overlap in the terms, e.g., tourism may be thought of as a sector that includes hotels, restaurants, taxis, etc., or as an industry) or a grouping based on other attributes (e.g., export sector, consumption sector, etc.). On the production side, there are three major sectors: primary industries, that use natural resources directly (e.g., mining, forestry, agriculture); secondary industries, which produce goods (manufacturing); and the tertiary sector, which produces services (e.g., retail trade, transportation, finance, professional services). Government may be included in the tertiary sector or carried separately.

EVALUATION CRITERIA

The purpose of policy analysis is to inform decision-makers of the consequences of alternative choices; since consequences must be stated in terms that reflect qualities that are of interest to the decision-maker, policy analysis must deal with the goals of public policy as well as its impacts. Goals, however, are generally not known beforehand-- in fact, they are usually not revealed until a choice is made-- so the analysis must be able to provide information with respect to a wide range of possible goals. Although this is difficult to accomplish, guidance can be derived from the consideration of several general criteria.

Community of Interest

Only partially resolved is the question of who or what is the population or group that constitutes the legitimate concern for the city government. While the current resident population is probably the primary concern, future residents, absentee owners of capital, non-resident workers, visitors, resident voters and workers, and those who bear the specific burdens or receive the benefits may deserve some consideration in addition to that which is given to all persons whose domicile falls within the boundaries of the City and County of San Francisco. When city government establishes policy it should have a clear idea of who are the clients.

Efficiency

The overall concern of efficiency is how effectively society allocates its scarce resources to achieve agreed upon goals. According to classical economic theory, the greatest good for the greatest number is obtained when resources are valued and allocated in smoothly functioning markets that consider the true social costs-- in terms of alternative uses foregone-- and accurately perceive social benefits. The theory then goes on to describe how this will happen without outside interference.

In reality, of course, markets do not function perfectly, and commonly require outside interference (by the public sector) to correct misallocations. One approach-- that of the centrally planned economy-- accepts the premise that markets do not operate satisfactorily and must be replaced by explicit controls.

An alternative approach is to discover in what ways specific existing markets do not operate correctly and adjust the parameters of market behavior to offset the biases. It is assumed that public policy in San Francisco is oriented toward this latter approach.

A wealth of theory and empirical evidence exists regarding the performance of various markets, evaluating that performance and proposing mechanisms for improving it. One kind of market imperfection, for example, is the underpricing of a resource. If highrise buildings do not pay the full costs of fire protection (through property taxes and fire insurance) then an incentive is created to undervalue fire protection services and human life and to overbuild highrises. When resources are overvalued, the opposite effect occurs.

Public policy instruments that can be used to correct market behavior are numerous and range from public ownership and provision of services to regulation, taxes, and subsidies. Much of the concern for environmental issues can be viewed as a debate over whether natural resources -- air, water, views, urban aesthetics -- are being correctly valued. Transportation is a sector in which the user is almost never faced with the correct costs, a situation that undoubtedly leads to substantial distortions in the consumption of transportation. In general, it is preferable to correct such market imperfections directly, rather than indirectly, e.g., raising charges to automobiles to cover air pollution as opposed to stopping highrise development because it generates traffic. In many cases, however, the preferred solution is not available and a second-best solution must be sought.

Equity

The other side of the coin from efficiency, equity is the question of who gets what, or who bears the costs as opposed to who receives the benefits. For many reasons, persons and organizations that already have a substantial claim on society's resources tend to be able to adapt to changes and take advantage of them for their own benefit; often this includes passing costs on to other persons less favored. Hence special attention must be paid in public policy to insuring that the less favored have a chance to improve their situation or are at least not injured further.

Stability

In a stable environment, individuals are more likely to be able to predict the consequences of their own actions and those of others, and feel confident that what they can save and accumulate will yield benefits in the future. Balanced against these virtues is the need for innovation and change. Too much stability leads to stagnation, while too rapid a pace of change may create chaos and disintegration. Even when the path to improved efficiency or equity is clear, progress must be measured to allow individuals and institutions to adapt. Economic growth may generate net benefits to the City of San Francisco, yet the pace of change may produce hardships for some individuals; in this case, the City might wish either to slow down growth somewhat or identify and compensate for the hardships.

CONCEPTUAL FRAMEWORK

An inherent conflict occurs between the need to have comprehensive knowledge in order to assess the secondary effects of any policy, and the need for precise information in order to make a good decision in any specific case. Since the growth issue is such a large and complicated one, the conflict between comprehensiveness and specificity is aggravated.

To resolve this conflict, we have constructed a conceptual framework to be used to organize and guide the design of a series of partial analyses. For this strategy to be successful, a delicate balance must be maintained between the overall framework, the policy issues that are of concern, and the specific information and methodology that are necessary to provide any substantive results. In the absence of a robust framework, policy questions tend to chase each other round and round without ever reaching a starting point. Yet conceptual frameworks are bound to be empty armchair pipedreams if they are not addressed to policy issues and forced to guide specific analysis of the issues. Further, if an awareness of the policy issue is lost, concern for the microscopics of methodology can take its place. A great deal of judgment is required, and the best strategy depends more heavily upon the details of the context than on any general procedures that can be set down a priori.

The framework presented below reflects a strong orientation towards the economic structure of the metropolitan region and the City, since we are of the opinion that this is the heart of the structure through which problems arise and policy impacts

are transmitted. Again, a balance must be struck between a framework that is so open that it provides little in the way of guidance and one that is so tightly ordered that it precludes learning anything about the underlying structure of the system. Ideally, a framework should display all the general aspects that are well known and suggest ways of learning about the features that are not known. In practice, the range of things about which there is partial but incomplete understanding is so large that a great deal of discretion is possible about what to regard as correct and also fundamental. The framework portrayed in Figure 2 and described below is our attempt to impose an intellectual order for aiding analysis and policy formulation, but it should always be regarded as a temporary device -- to be revised, improved, discarded, or any combination of these which works best. This framework is conceptualized in terms of stocks and flows, with rectangles representing stocks and lines indicating possible significant flows.

Six components form the backbone of the framework, each representing the status of some major stock with respect to the City. Flows occur into, out of and between these stocks, constantly changing them. The changes over time and the relationships between changes in one stock and changes in another are the overall questions of interest for a structural understanding of the City's functions. Because it is usually the distribution of elements within a stock that is important, rather than its total size, stocks are subdivided into appropriate subgroupings.

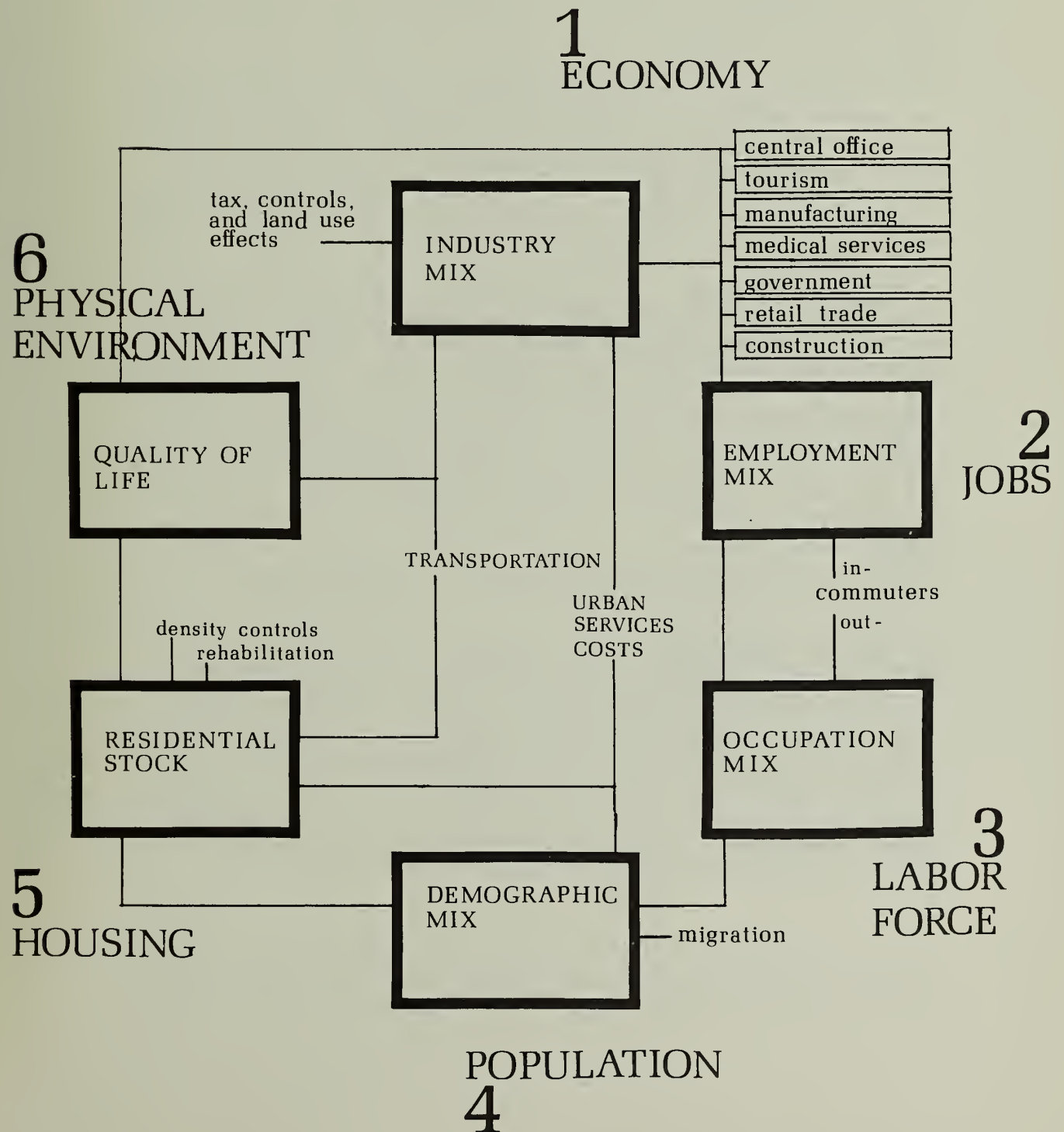
(1) Industry Mix. The state of the economy is reflected in the types of industries present and their relative magnitudes, measured in such terms as value of resources consumed, value of capital stock, number of jobs or value of payroll, total output, and growth rate. Current concern in San Francisco revolves around the tertiary sector and the finance, insurance, and real estate industries in particular, since much of the downtown high-rise and office uses falls into these categories.

(2) Employment Mix. A major aspect of the types and levels of industries in the City is the number and types of workers they employ, i.e., the jobs created by the economy, both currently and in the future. Certain types of jobs go with certain types of industries, e.g., office industries employ white collar and professional labor, while manufacturing industries employ blue collar workers. A shift from one industry to another implies a corresponding shift in the types of jobs offered.

(3) Occupation Mix. Attention is shifted in this component to the types of skills available in the San Francisco work force,

Figure 2

CONCEPTUAL FRAMEWORK



which may be entirely different from the same attributes of the jobs offered within the boundaries of the City. If the mismatch between jobs in the City and the skills of resident workers is excessive, problems may result for the City both in the handling of commuter transportation and in financing City services. There is also a relationship between types of workers and some attributes of their families, such as marital state, number of children, income, and preference for residential environment and life style.

(4) Demographic Mix. This stock includes the total resident population of San Francisco, regardless of employment status. Only about 40% of the population are members of the work force, so the remainder are in some way dependent upon the former for their sustenance (although not necessarily dependent upon local workers, as in the case of public assistance programs). Again, the number of dependents and their attributes is related to the kinds of workers that live in the City, and also to such factors as City services, residential policies of adjacent communities, life styles available and the nature of climate and amenities.

(5) Residential Stock. Since the housing stock turns over very slowly, the historical patterns of development and the types and quality of housing built in the past have a long term influence on the characteristics of the residential units that are currently available and will be available in the future. Demolition and new construction are of considerable importance, but they alter the nature of the stock very slowly. Thus the population is in some way affected by the housing that has been constructed in the past, and the population in turn alters the characteristics of the housing supply. Number of bedrooms, number of square feet per apartment and per room, density of persons, density of units, type of architecture, age, quality, etc., indicate some of the important variation that is found in the housing stock.

(6) Physical Environment. To complete the description of the state of the City, we can think of such elements as land use, air and water quality, the quality of life, visual and cultural amenities, etc., as stocks also. A change in economic activity that released land for other uses or reduced the quality of the air would be creating a flow with respect to the stocks in the physical environment. A notable characteristic of these stocks is that they are often difficult to measure in any units and nearly impossible to place a value on, and hence they require special attention from public planners and policy-makers.

IMPLEMENTING THE STUDY DESIGNS

Using the conceptual framework to break the topic of growth down into smaller pieces, a series of studies have been designed to address the partial questions that relate to various policy issues. If the overall framework is a good one, then results of the partial studies will complement each other and also have validity on their own, independent of the overall structure.

The designs proposed below are far from complete and nowhere near specific enough to carry out routinely. They are an attempt to reduce the area of discretion from the global to a limited subset; if these are good study designs, then further refinements of the scope and methodology of any one study will not require reorganizing the overall structure. The level of specificity is a relative term, but increasing specificity requires additional substantive information about the problem to be addressed. In other words, adding more detail to the designs would necessitate obtaining and processing more information about San Francisco and the problems as they uniquely affect the City. At no point should a study design become automatic -- i.e., capable of being executed without using additional judgment -- not because such studies are impossible to design, but because such studies are not likely to produce relevant results. Policy issues should always be kept at the front of any study, and the methodology constantly adapted to new information about the problem as it is obtained.

Thus the problem of study design is complicated by the undesirability of specifying in advance a list of studies to be undertaken in a particular order. Any large-scale study should be prefaced by a series of smaller studies that support the need for the larger effort. In doing this, the appropriate scale of study to carry out depends upon the amount of previous work that can be drawn upon to contribute directly to the issue at hand. Although the range of possible scales of effort is in reality a continuum, three levels can be identified for illustrative purposes:

Preliminary Study

Any information that can be easily utilized (secondary data, informed sources) and will provide an estimate of the magnitude of the problem and the amount of effort that will be required to

learn more should form the basis for a preliminary study. The evidence need only be circumstantial, but should strongly suggest that the feasibility of further study is high, in terms of both cost and yield. Included in the preliminary study should be an improved design for subsequent analysis. Such a study could be accomplished in a few weeks by one or two staff members or an individual consultant.

Minimal Study

A low budget study should be undertaken to expand upon the information identified in the preliminary study, utilizing primarily secondary data sources, simple kinds of processing, generally established techniques and theory (or else consider the study itself as experimental), and a narrow well-defined scope. It is better to get some solid but incomplete information about a subject that is of interest than to cover too broad a topic with inconclusive results. As always, the particular scope chosen for partial analysis is critical. If it appears warranted, part of the output of a small-scale study should be the design for future long-term or large-scale analysis.

Full Scale Study

Probably several small scale studies should contribute to the design and implementation of a single large-scale study, since a more ambitious level of effort generally implies an integration of several sub-topics that have interactions whose consequences have major policy implications. Very few large-scale studies have produced very useful results. While there are many reasons for this --failures on the part of both the client and the contractor-- most of these could potentially be avoided by more attention to preparing a good foundation of preliminary work to guide the larger effort. Again, execution of the design should not be automatic; on the contrary, it is all the more imperative that a large scale study have a great deal of flexibility and adaptability built into it, since the investment is larger and unknown topics are being explored at greater depth. Hence the study designs presented below do not recommend first priority be given to any large-scale studies.

II. METHODOLOGY



One of the most complex and difficult problems facing the field of city planning--or any field concerned with policy problems--is how to select an appropriate methodology and how far to carry it. Many, many methodologies, techniques, technologies, etc., are conceivably useful, and almost any one could absorb all the resources available now and in the future. Hence any analysis that is carried out is at the direct expense of a multiplicity of other analyses that could have been implemented instead.

One of the reasons why so little guidance on methodology can be found is that historically either no attempt has been made to understand the problem in a substantive way, leaving the outcome completely to the political process; or problems have been approached from the standpoint of the application of a particular discipline, e.g., economics, engineering, comprehensive planning, etc. The result of the latter approach is that the methodology used has been determined more by the skills of the analyst than by the dictates of the problem. Since most problems touch on several areas of expertise, the challenge is to insure that problem and policy determine what mix of tools to use and not the other way around.

CHARACTERISTICS OF GOOD METHODOLOGY

Although relatively little experience has been gained to date, there is enough to begin making some general observations and hazard a few guesses about what classes of methodology are usable, what characteristics of problems match with characteristics of methodology, and which attributes of methodology are particularly critical for policy analysis. As a framework for our remarks we will use a discussion of six attributes of methodology (see Figure 3) as they apply to studies used in urban planning. A few rules can be proposed, and some a priori preferences indicated for certain kinds of methodologies over others.

Comprehensiveness

Defined as the size of the set of endogenous variables (those included inside the model or analysis, as opposed to being assumed as given), this scale ranges from very partial methods at one end to very general models at the other. Marginal economic analysis, in which most of the context is assumed to be unchanging for the purposes of the analysis, is an example of a partial method. General equilibrium theory is at the other end.

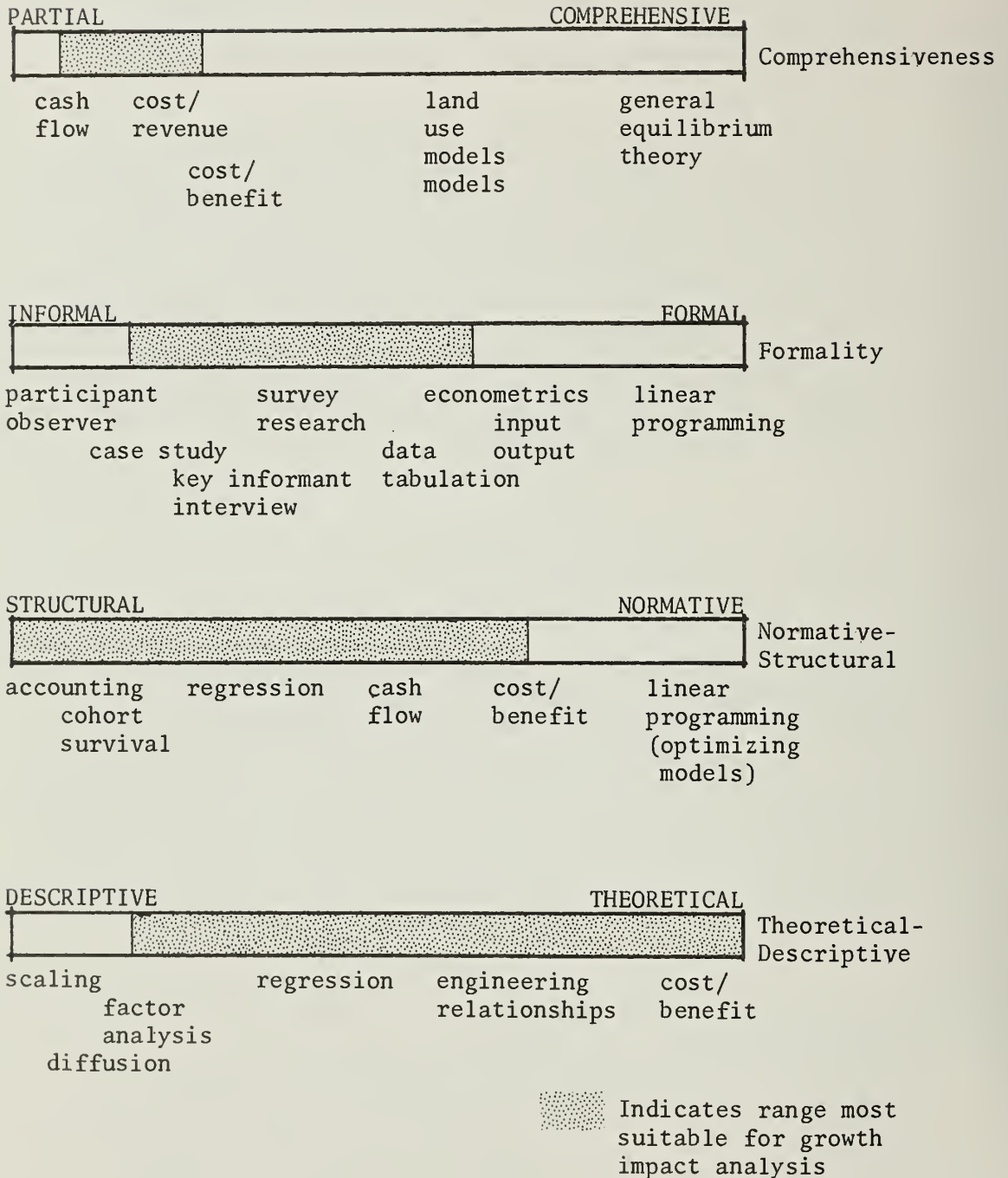


Figure 3. Important Attributes of Methodologies

Operationality

An attribute which necessarily parallels comprehensiveness is the quality of operationality. Only partial models can be made operational for policy purposes, that is, can provide the reasoning and specificity necessary to distinguish policy alternatives. Attempts to operationalize more comprehensive analyses have resulted in such efforts as land use models and large computer simulations. The conceptual framework offered above is an example of a comprehensive design that is clearly not operational, in the sense that it is not possible to get results directly from the design. Its purpose is to help organize more partial analyses into a consistent and mutually reinforcing pattern.

Thus the analyst should be extremely suspicious of attempts to operationalize overly ambitious comprehensive designs. The sole value of a global view is as an aid in designing the most appropriate partial analysis. This is not meant to say that all partial analyses are good; but, rather, that all comprehensive approaches must be translated into partial analyses before they produce usable results. That is why the study designs presented above are each intended to be as narrow in scope as possible without arbitrarily ruling out important factors.

Formality

Methods may be highly formal, in which case the primary effort is in making the problem of interest fit the method, or highly informal, in which case the method is used to develop an intuitive understanding of the problem rather than solve it. Whether a formal or an informal method is preferable depends to some extent upon what formal methods are available, but more importantly, on how much is already known about the problem. In general, the most formal method that is applicable will yield the best results, but the danger of using too formal a technique is that, after translating the problem into the proper format for the methodology, the wrong problem will be addressed.

Because the vast majority of policy problems are fuzzy, open-ended, ill-structured, and contain a multiplicity of goals and hence measures for evaluating a solution, very few formal techniques have much applicability. A technique that falls towards the informal end of the scale is participant observation, in which the analyst becomes a part of the process that is of interest. Much use of this technique has been made in

anthropology for studying primitive societies. Obviously the participant observer analyst must possess a good deal of knowledge about the types of phenomena under observation, a resourcefulness and openness to unexpected information, and good judgment.

Another technique that tends to be fairly informal is the case study, since the techniques are designed to fit the case as the analysis is being conducted, but it may often be appropriate to apply a relatively formal micro-technique to a particular case. Moving into slightly more formal methods would include survey research, ranging from relatively informal and unstructured key informant interviews to more rigorous sampling procedures and careful instrumental design that allow statistical tabulation and analysis of the results. Multi-variate analysis--including multiple regression--and econometric techniques move another step in the direction of formal techniques, and operations research (mathematical programming, queueing processes, Markov chains, simulation) epitomize the formal end of the scale. As yet, these techniques have only the narrowest of applications to urban problems.

The most suitable techniques from the standpoint of formality run from the case study up through regression and correlation and fairly simple econometric model building. It is important to assess very carefully the state of knowledge about each specific problem, because there is a substantial opportunity loss from being overly informal, as well as the danger already mentioned from over formality. If the maximum amount of prior knowledge is not utilized, then the result of the analysis is that judgment and intuition have been employed to yield qualitative information that contributes little to the state of knowledge.

Descriptiveness

Techniques which are descriptive simply reduce or transform information without imposing an intellectual structure upon it. An example of a formal descriptive technique is factor analysis, which relies very little on the substantive content of the variables being transformed. An informal descriptive technique might be the kind of case study which provides a simple chronology of events or a journal or newspaper account of something. The utility of a descriptive technique depends upon the analyst's subsequent ability to make inductive generalizations from the information, i.e., perceive patterns in the data. The patterns must then be tested, of course,

with a different set of data. The pitfall of overly descriptive analysis is empty empiricism.

Theoretical Power

The opposite of descriptive in this context is theoretical. Similar to formality, the general rule is that the maximum amount of applicable theory should be applied to the problem--the amount learned is positively related to the amount of knowledge brought to bear--but a large amount of the theory that has been produced has little application to any problem. Thus it is often necessary to generate new theory as one goes along, formulating and testing at the same time. This is a slow process which is often subject to short run errors, but it is the only way to generate strong and useful theory.

Normative Content

The extent to which policy is prescribed or the solution to the problem generated by the analysis is a measure of the normative content of the methodology. Operations research techniques are highly normative but have limited applicability to problems of interest, and hence must be largely rejected. The vast majority of normative guidance comes from economic theory, as expressed in such techniques as cost/benefit and cost/revenue analysis, and various other kinds of social accounting frameworks.

At the other end of the scale from normative methods are structural or behavioral methods which emphasize "detached objectivity." While more normative content is better than less, all other things being equal, the state of knowledge about most urban problems is such that simply understanding the problem requires the major effort. Often, once some degree of understanding is reached, a plausible route for improving the situation is readily apparent. Thus techniques falling pretty much all the way across the normative spectrum are useful in planning, depending upon the context.

IMPLICATIONS FOR STUDY DESIGN

Applying the considerations mentioned above to the problem of matching issues with analytic techniques has resulted in certain patterns that can be described in some general ways. First of all, the methodologies proposed are as flexible as possible. Techniques of this type tend to be partial, informal, and based on reasonably good theory, all of which require a lot of insight and judgment in the implementation of the methodology. Since flexible methods are meant to respond to the needs of the problems being analyzed, they cannot be specified in great detail before starting. Thus the study designs consist more of narrower conceptual frameworks than particular formal models or tightly delineated work plans.

The first study, for example, seeks to understand the structure of the San Francisco economy within the Bay Area. One research design would be to list a set of simultaneous macroeconomic equations and propose definitions for each of the variables. The data would then be collected and the equations fitted by econometric techniques. Aside from the cost of such a study, it is a design that is completely determined before starting; there is no way for it to adjust to structural understanding about the problems of interest. Instead, we suggest initially an attempt to utilize a variety of cross-sectional and longitudinal data series in a set of separate but related partial analyses. If at some point a more ambitious integrated design appears worthwhile and feasible, it can be undertaken.

A second pattern in the study designs is that they depend upon a great deal of learning that must take place in the process of carrying out the study. The analysts must be closely connected to the problems and the decision makers, or else the study is likely to address irrelevant problems and the decision makers remain ignorant of whatever understanding is developed by the analysts. Clearly, then, it is imperative upon City officials to stay on top of the studies and force them to address the issues currently on the fire. For their part, decision makers should make a serious attempt to understand and face the implications of results of the analysis as they emerge.

Finally, there is more emphasis placed on relatively descriptive kinds of study because there is considerable need to develop some quantitative feeling for the magnitudes of the

problems. This can be done using rather simple indicators, such as the shares of various family types and age and ethnic groups in the City's population, and the changes occurring in these shares over time. Once this information is digested, attention can be given to why particular changes may be occurring and how they might be influenced.*

* A modest but excellent example of the research approach recommended here is embodied in The Ann Arbor Growth Study, published by the Ann Arbor City Planning Department in 1972 after over a year of staff work and citizen review of draft materials.



III. STUDY DESIGNS

Each proposal for a study is outlined according to a standard format, whose categories are described below. The studies are numbered to correspond with the numbers indicated on the diagram of the conceptual framework, and grouped into subsets of closely related topics. Table 1 summarizes estimated costs and priorities.

(1) Major Issues. Each study design is aimed at a few policy questions that appear to be of significant interest. In most cases, the issues cannot be dealt with directly, and need to be reformulated into research questions.

(2) Research Questions. These attempt to state most succinctly what the substantive questions relating to a policy area consist of. They are more general than testable hypotheses, but sufficiently detailed to indicate needed data and appropriate methodology.

(3) Policy Implications. In this section the reasons why anyone might want the answers to the questions posed are suggested, and the ideas provided for the ways the information might be reflected in policy decisions.

(4) Study Design. Methodology for executing the study is offered next, with some discussion of alternative strategies. Often the best methodology to employ depends a great deal upon the level of effort to be mounted.

(5) Data. Secondary data sources that have been located and that are applicable to the study design under consideration are listed.

(6) References. A selected list of bibliographic entries is presented, which are sources for both the methodologies recommended and examples of their applications. In most cases, the references available are somewhat tangential to the topics, because there is no conventional set of problems and no accepted standard methodology for working on the problems.

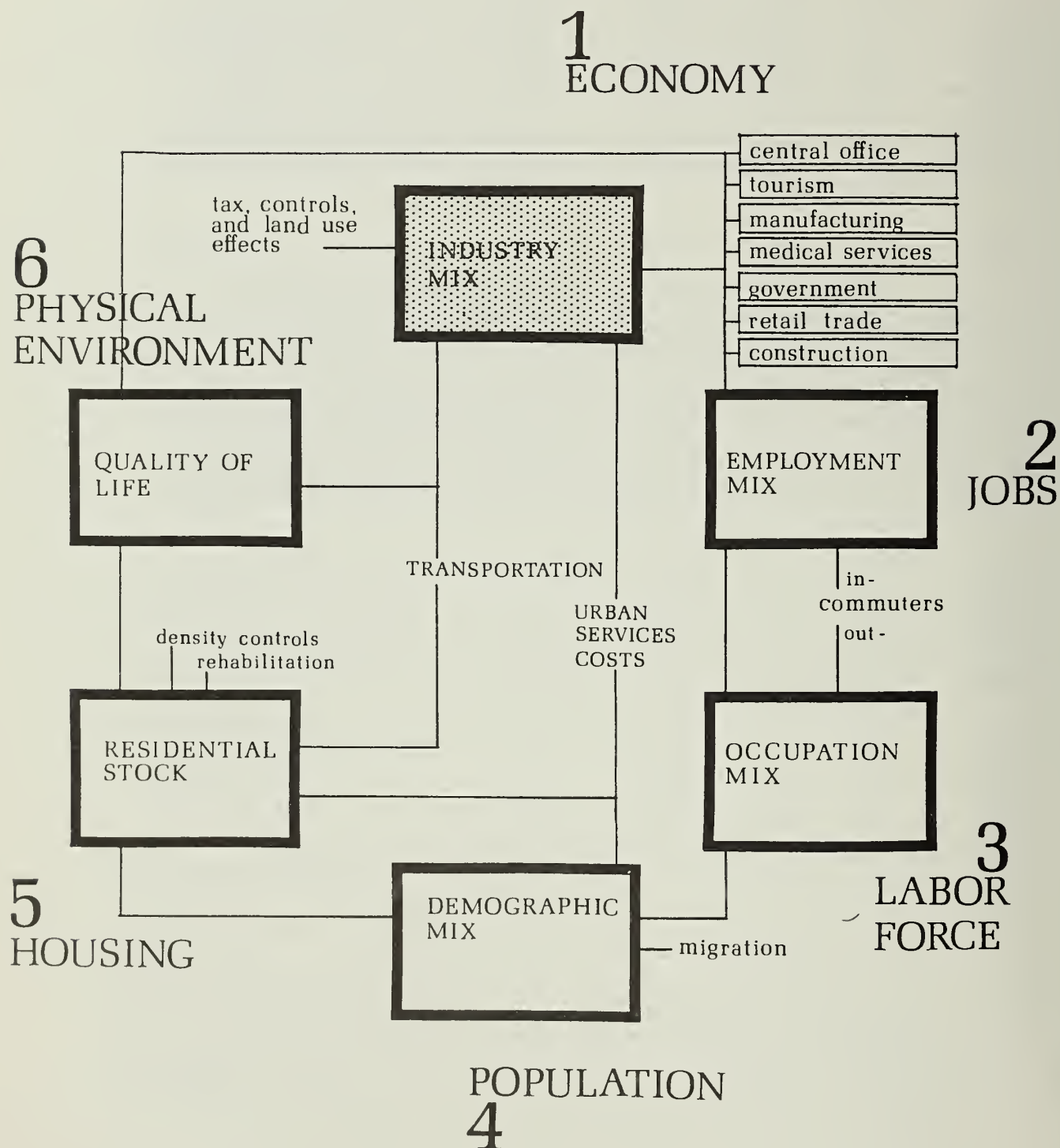
TABLE 1: RECOMMENDED PRIORITIES AND ESTIMATED COSTS OF STUDY DESIGNS

Study Titles	Preliminary Study Priority	Small-Scale Study Priority	Est. Cost	Priority	Est. Cost
1. Economy					
A. Trends	High	Medium	\$50,000	Low	\$500,000
1. Central Office	High	High	20,000	Medium	70,000
2. Tourism	High	High	30,000	Low	100,000
3. Manufacturing	Medium	Medium	10,000	Low	50,000
4. Medical Services	High	High	10,000	Low	100,000
5. Retail Trade	Medium	Medium	15,000	Low	60,000
6. Government	Medium	Medium	10,000	Low	50,000
7. Construction	Low	Low	5,000	Low	40,000
B. Property Taxes, Land Value, etc.	Medium	Medium	25,000	Low	50,000
C. Transportation and CBD Growth	Low	Low	35,000	Low	100,000
D. Fiscal Impacts of Transportation	High	High	10,000	Medium	100,000
E. Service Requirements	High	Medium	5,000	Low	30,000
2. Jobs					
F. Relation of Industry to Employment	High	High	5,000	High	50,000
G. Fiscal Impacts of Commuters	High	High	25,000	Medium	100,000
3. Labor Force					
H. Labor Force Characteristics	High	High	10,000	Low	40,000
4. Population					
I. Demographic Trends	Completed	High	10,000	High	5,000
J. Motives for Intra-Metropolitan Migration	High	High	15,000	Medium	75,000
K. San Francisco as an Immigrant Reception Station	Low	Low	5,000	Low	30,000
L. Growth Controls in Neighboring Communities	Low	Low	5,000	Low	20,000
5. Housing					
M. Housing Stock and Population Characteristics	Completed	High	25,000	Medium	90,000
N. Housing Rehabilitation and Conservation	Medium	Medium	5,000	Low	25,000
O. Residential Density Control	High	High	10,000	Medium	60,000
P. Neighborhood Impacts of Transportation	High	Medium	10,000	Low	50,000
6. Physical Environment					
Q. Environmental Impacts	High	Medium	25,000	Medium	200,000
R. Amenities, Aesthetics, and the Quality of Life	Medium	Medium	10,000	Low	100,000
S. Land Use Distribution	Medium	Medium	5,000	Medium	20,000
T. Natural Hazards	In Progress	Low	10,000	Low	150,000
Total Preliminary Studies of High Priority	13				
Total Small-Scale Studies of High Priority		11	\$170,000		
Total Full-Scale Studies of High Priority				2	\$ 55,000
Total Estimated Costs for All Studies		27	\$400,000	27	\$2,275,000

(7) Cost. The range of costs is bracketed between the minimal level required to accomplish a small substantive study and the amount that would be needed to undertake a major effort. Since there is so much flexibility in the designs, the cost estimates cannot be very precise; but they are intended to include the labor, overhead, materials, and hardware costs (without profit) independent of whether the City undertakes the study or it is contracted to a consultant. No doubt there will be cases in which the marginal cost to the City might be substantially less than the estimate provided; on the other hand, estimates for the cost of accomplishing policy analysis and research tend to be biased downward due to underestimating the amount of development of methodology needed and the costs of unforeseen problems.

(8) Recommendations. Within the qualifications mentioned above, the best information that we can provide regarding the urgency of the study and the reasons for this urgency are stated. Since the choice ultimately rests with the City Planning Department and other agencies, and depends upon their perceptions of the problems, our recommendations can only be tentative at best. This is not to say that there is no basis for recommending one study over another; only that we lack the information at this point to be able to offer much guidance.

1. ECONOMY



A primary driving force--perhaps the dominant one--affecting life and work in the City is the set of activities that make up the City's economy. On a broad level, there are many national, international, and regional forces that influence the structure and performance of the local economy, and it is necessary to develop an understanding of San Francisco's place within the larger economic context in order to know which trends can be countered and which should be adapted to instead. If national shifts in the location of manufacturing and the size of the service sector (e.g., finance, government) mean that all large central cities lose manufacturing employment and gain office activities, then it is probably futile for San Francisco to try to hold the line. At a lower level, sectoral shifts within the City's economy may lead to a spatial displacement and redistribution that require actions on the part of the local public sector. Expansion of medical complexes into residential neighborhoods and the departure of highly land intensive warehousing industries are but two examples of shifts that have significant land use consequences. Finally, there are a number of more localized or narrow issues that relate to the economy: how land use controls and height limitations affect land value, the impacts of alternative transportation investments on the structure of the central business district, the costs to the City of existing public and private transportation modes, and the problems of supplying the economic activities in the City with government services that benefit real property.

A. TRENDS IN SAN FRANCISCO ECONOMIC GROWTH

A thorough study of the local economy would identify the various sectors or industries of interest, estimate the past trends in investment and output in these industries and forecast them into the future, compare the sizes and trends of local sectors with national and regional trends, and trace out the implications of these trends on local employment, capital investment, land use, transportation, demands for City services, etc. Clearly, such a study is a major undertaking. Although some financial and real estate firms carry out studies of this general nature, a major economic study for San Francisco or the Bay Area would be an especially worthwhile effort if the funds were available. On the other hand, individual sectors of primary importance can be investigated independently if a comprehensive study is not feasible. Both types of study design are proposed here, but

questions relating to a specific sector are listed only in connection with the study of that sector; thus an overall study would deal with all the sectoral issues as well as the more comprehensive issues listed immediately below.

Major Issues

Is economic growth necessary to support the San Francisco economy?

Does the CBD support the rest of the City?

To what extent is growth--in the aggregate or in specific sectors--determined by factors outside the control of the City?

Are there fiscal benefits to the City budget from increased economic activity?

How dependent are local industries--particularly in the high intensity CBD--on direct communication contact, physical proximity, a climate of innovation, or other external economies related to concentrations of economic activity?

Are there internal scale economies or diseconomies in the private sector that would generate increased prosperity if scale or output were increased?

Are there economic incentives that tend to pressure San Francisco into becoming larger than it ought to be?

Research Questions

What are the major sectors in the San Francisco economy?

What is the size of capital investment and employment in each sector? How are these changing over time?

What are the costs facing different industries and how are these changing over time? For which industries is San Francisco a superior location and for which is it inferior? Can this cost structure be altered?

Which industries are responding to regional or national demand in either growing or declining markets, and which industries are oriented towards local supply factors?

Which industries are labor intensive and which are capital intensive? Which are land intensive?

Policy Implications

Two broad policy applications could be derived from this study. First, better knowledge of the structure and trends in the local economy and its context would allow the City to concentrate its energies on points of critical stress where the most leverage can be exerted for the benefit of the City. Second, the background information provided by the study would be invaluable for guiding policy analysis in other problem areas, such as unemployment, population migration, environmental concerns, and neighborhood issues.

Study Design

A fundamental structural question that should not be resolved prematurely is the nature of the balance between demand and supply factors in the components of the economy. Supply factors (e.g., the presence of a specialized work force) are potentially of significant importance in San Francisco. Thus such demand-oriented models as the export base (regional multiplier or economic base) or input-output frameworks should be used only for sectors for which exogenous (external) demand is clearly the motivating force. At least four alternative approaches can be taken, starting with the relatively simplest.

(1) Descriptive Patterns. Using a wide variety of secondary information sources, cross-sectional (broken down by industry) and longitudinal (time series) patterns can be generated that will indicate which are the major sectors and how they are behaving over time. Although categories can be aggregated, they must be taken as they are reported, which will make the study of certain sectors (tourism and medical services, for example) difficult or impossible. In general, data from different sources will fit together awkwardly, creating overlaps and leaving gaps, but considerable information does exist. Regional and county levels are the most complete, but more local sources can also be obtained.

Economic production can be measured either by estimating and adding up the returns to all factor inputs (capital, labor, land) or by estimating and adding up the value of all outputs. In theory, this "value added" approach would be the ideal method;

unfortunately, available data on value added exists only for the manufacturing sector and for construction aggregated at the state level. In other sectors, primary data on value added would have to be generated and would require either a complicated and expensive estimating procedure or extensive surveys. Other measures of output (such as total sales) are also not available for all sectors.

Measuring economic activity in San Francisco by estimating the inputs would, on the surface, appear to be more promising. The Bureau of Labor Statistics' Employment and Earnings Bulletin and the five-year Censuses of Business collect data on total wage bills of business establishments. The BLS materials, however, are tabulated by SMSA, which presents a disaggregation problem; special tabulation of San Francisco alone might be requested but would be expensive and subject to sampling error. The cost of land inputs (i.e., rents) and the annual returns to capital (i.e., dividends, interest, and profits) are not published in a comparable way for each sector.

This less than ideal data situation leads to a more ad hoc procedure. For each sector a different set of indicators, based on data readily available, could be used to show the trend within that particular sector over time. For example, if the only data available for freight transport are mileage and tonnage figures, then trends in terms of these figures can be analyzed without using price information. The important consideration is that the analysis be in terms of data which is available for several points in time (preferably annually) and which can be aggregated or disaggregated in such a way that it covers the City of San Francisco.

Trends for various sectors of the city's economy are much more meaningful if they can be compared with regional, state, and/or national trends. This aids in determining the extent to which exogenous factors may be responsible for the trends. Particularly useful would be to compare trends in San Francisco's share of the region's retail business, or its share in port business, to give two specific examples.

(2) Comparative Advantage. Analysis of the economy could begin by selecting those sectors or industries that appear from circumstantial evidence to be of the greatest interest, and study those industries intensively. Empirical growth rates in various indicators, profitability analyses of particular industries or types of firms, and case study financial analyses of selected firms could form components for this study. Particularly oriented towards the supply side, the comparative advantage framework asks where is the most profitable location for a particular industry and what are the

most profitable industries for a particular location. In many cases, demand is largely predetermined and so the question revolves around costs: transportation for inputs, outputs, and the work force; availability of specialized intermediate inputs and services; importance of neighborhood effects and other external costs and benefits; and inter-industry structural relationships. Effects of strong unionization on the costs of labor could also be included.

(3) Regional Economic Study. Major economic studies have been done for Pittsburgh, New York and a few other metropolitan areas, using national accounting concepts applied to regions plus an eclectic assemblage of economic base, multiplier, input-output, econometric models and other essentially macro-economic techniques. In this study, as in the comparative advantage study, fairly extensive industrial surveys are required because adequate secondary information is not available for supporting the kinds of analysis involved.

(4) Econometric Model. The most formal and rigorous of the proposed study design approaches, econometric modelling depends upon high quality specialized data and equally high quality specialized statistical and economic talents. Potentially, this approach provides the largest amount of quantitative information, complex interrelationships can be incorporated into the model, and the framework is the most flexible in terms of adapting to local conditions. If these attributes are sufficiently important, an econometric model is the only possible way to obtain them.

Secondary Data Sources

U.S. Department of Commerce, Census of Business, 1963 and 1967.

U.S. Department of Commerce, Census of Governments, 1967

U.S. Department of Commerce, Census of Manufactures, 1963 and 1967

U.S. Department of Commerce, County Business Patterns, (annual)

U.S. Department of Commerce, U.S. Foreign Trade: Waterborne Exports and General Imports, (monthly)

U.S. Department of Defense (Presidio)

U.S. Department of Labor, Employment and Earnings for States and Areas, 1939-1971

California Board of Equalization, Annual Report (annual)

California Department of Human Resources Development, California Community Labor Market Surveys (1967-8 and 1969-70)

California Department of Human Resources Development, Area Man-power Review: San Francisco-Oakland Annual Outlook and Planning Report, 1973

California Department of Human Resources Development, Summary of Employment and Unemployment: San Francisco-Oakland Metropolitan Area, 1966-72

San Francisco Visitors and Convention Bureau

Security Pacific Bank, Monthly Report of Building Permit Activity in the Cities and Counties of California

References

William Alonso, "The Question of City Size and National Policy," (Berkeley, California: Institute of Urban and Regional Development, University of California, June, 1970).

Roland Artle, The Structure of the Stockholm Economy (Ithaca: Cornell University Press, 1965).

George Borts and Jerome Stein, Economic Growth in a Free Market (New York: Columbia University Press, 1964).

Werner Hirsch, Elements of Regional Accounts (Baltimore: Johns Hopkins University Press, 1962).

Edgar Hoover and Raymond Vernon, Anatomy of a Metropolis: The Changing Distribution of People and Jobs Within the New York Metropolitan Region (Cambridge: Harvard University Press, 1959).

Simon Kuznets, "Modern Economic Growth: Findings and Reflections," American Economic Review, 63,3 (June, 1973), pp. 247-258.

John Mattila and Wilbur Thompson, "Toward an Econometric Model of Urban Economic Development," in Harvey Perloff and Lowdon Wingo, ed., Issues in Urban Economics (Baltimore: Resources for the Future, Johns Hopkins Press, 1968).

Security Pacific National Bank, San Francisco Bay Area Report: A Study of Growth and Economic Stature of the Nine Bay Area Counties (San Francisco: Security Pacific National Bank, 1971).

Costs

Simple tabulation of secondary data could be accomplished for whatever sum could be spent, and the results would be of interest as long as some intelligence were used in selecting which indicators to follow. A minimum study using secondary data along the lines of the descriptive methodology would cost at least \$50 thousand, and a full scale regional or econometric study would be in the \$500 thousand range. Industrial surveys in the City could range from \$10 to \$100 thousand, and a serious regional survey would probably start at about \$100 thousand.

Recommendations

A substantial economic study has never been done for the City or the Bay region, and would be a very worthwhile undertaking. Given the costs, however, the likelihood appears small. Short of a full scale study, a small descriptive analysis and tabulation, perhaps supplemented by local field surveys, would provide high priority basic information with both direct and secondary benefits. If additional funds are limited, or as an alternative, effort could be concentrated on studies of sectors that loom prominently. The series of study designs which follows contains those sectors that stand out, listed in approximately their order of priority.

A-1. CENTRAL OFFICE

When references are made to San Francisco becoming a single industry town, the industry at issue is central office activities. Although composed in actuality of such diverse industries as finance, real estate, insurance, headquarters, professional services, business services, and many others, this group of activities has some characteristics that distinguish it in many ways from other sectors and suggest the need for a serious analysis.

Major Issues

Has the growth of the office sector slowed the exodus of jobs from the City?

Is San Francisco doomed to become as intensely developed as Manhattan?

Has the demand for office space reached or passed its peak?

Are highrise buildings good or bad for the City?

Should some of the growth in the office sector be shifted from downtown to centers in other areas of the city?

Research Questions

What is the current stock of office space in San Francisco and how fully is it being utilized?

What changes are occurring in the stock through new construction, demolitions, and conversions?

What is the spatial distribution of construction, conversion, vacancies, etc?

How many jobs are located in downtown offices and other areas and what are the characteristics of the jobs?

What are the costs and benefits to the city of various patterns of expansion of central office activities (e.g., highrise versus lowrise, CBD agglomeration of activities versus scatteration)?

Policy Implications

Office construction in the downtown has been one of the more controversial activities in the City in the recent past, and already the subject of a good deal of study sponsored by the Chamber of Commerce and by SPUR. Two height limitation initiatives have been directed specifically against highrise offices. Understanding the economic and physical structure of the industry would allow restrictions to be placed on the industry so as to preserve or enhance those qualities of the City that residents and visitors find most enjoyable while doing as little as possible to compromise the economic viability of those industries that require central office facilities. Depending upon demand, additional space might be obtained from vacancies, conversions of other downtown properties, upgrading of existing space, higher utilization of occupied space, or land uses outside downtown.

Study Design

Secondary data on office space and the central office sector are very sparse, so some additional data will probably be needed even at a small scale of effort. Two approaches can be proposed:

(1) Existing building permit materials can be used to calculate square footages and to investigate current usage on a stratified sample of commercial buildings. Due to inconsistencies and lost records, this would certainly require extensive field work.

The stratification of the sample could be based on the existing Land Use Tabulations for 1970. The "Auxiliary Code" information would be particularly useful; a count of commercial parcels by auxiliary use would indicate the size of the universe for each strata. Sampling percentages of between 5 and 10% should prove adequate, except for categories with less than 50 parcels in them. Such categories must be sampled more heavily to improve the reliability of the results.

(2) Another possibility is to work with the building permits office to improve existing record keeping. This would include addition of square footage information to building permits, along with a follow-up report on use of completed facility. Although not answering the above questions immediately, such changes would add greatly to the ease of monitoring all changes due to renovation and new construction undertaken after the institution of improved reporting.

A method that is commonly used to estimate office employment in the central area is systematic cordon counts that survey a sample of persons crossing into the downtown on a daily basis. The BATS data might serve this purpose, or cordon counts and roadside interviews conducted by the Metropolitan Transportation Commission.

Shifts in industrial mix--particularly in central cities--towards tertiary sector industries and central office uses will probably be found in national data on investment and employment. Since the trend is almost undoubtedly not unique to San Francisco, at least some understanding of the national pattern is in order. One aspect that is of concern is what would happen to potential office employment if land use or other controls discourage expansion in downtown San Francisco. Perhaps related to this is the recently observed pattern of decentralization of office functions (such as routine clerical, bookkeeping, and other record handling) which can be separated from the

more intensive headquarters and management functions and also take advantage of a secondary (female) labor market in the suburbs.

(3) A survey of downtown office space and total employment could be carried out fairly easily and would be the most direct way of obtaining information that is of paramount importance. A similar survey in Chicago revealed that all the available secondary sources greatly understated the amount of employment and space that in fact existed. Chamber of Commerce cooperation could probably be obtained, and the specialized skills required are not extensive.

Such a survey should focus on identification of the location and the approximate percentage of vacancies in several uses which are of special interest (general office space, warehouses, professional offices, etc) rather than an estimate of total stock. A further practical limitation would be to look only at those areas where significant levels of vacancy are expected, based on interviews with real estate and rental agencies. This approach could be used to evaluate the need for any more thorough study of the subject of commercial space vacancies via method 1 or 2. Some attention could also be given to the feasibility of conversion to other uses, such as the conversion of vacant industrial space to office space.

References

Peter Cowan, The Office: A Facet of Urban Growth (New York: American Elsevier, 1969).

Robert Fisher, The Boom in Office Buildings: An Economic Study of the Past Two Decades (Washington, D.C.: Urban Land Institute, 1967).

Boris Pushkaren (ed.), The Office Industry: Patterns of Growth and Location (Cambridge: M.I.T. Press, 1962).

Costs

A minimum study might be done from \$20 thousand and a full-scale analysis for about \$70 thousand, including about \$20-30 thousand worth of downtown commercial survey.

Recommendations

Since increase in downtown office space is perhaps the most controversial planning problem facing San Francisco and since that increase is predicated on a presumed need, this study should be very high priority. The decision on whether and how far to pursue this study should be based in part on the results of preliminary studies now being done within the DCP.

A-2. TOURISM

Tourism is clearly a major industry for the City, and yet very little is known about the size and structure of the tourist industry because it is hard to separate statistically from other sectors. Hotels, restaurants, entertainment, travel, etc., are consumed by residents and by other industries in the local economy, so the portion of business generated by tourism itself is difficult to determine. Hence such characteristics as employment, occupation, income and growth profiles are even more obscure; yet tourism is potentially one of San Francisco's most volatile industries.

Major Issues

Does the City make or lose money on tourists? Can losses be eliminated without seriously affecting the business?

How important is the tourist sector to the City economy?

Research Questions

How big is tourism, in terms of jobs, income, investment, etc?

Is tourism growing, either as a total or as a share of the City's economy?

What kinds of jobs are generated by tourism?

Do tourists take up the slack in local demand, supplementing the consumption of residents and supporting a higher level of services, or do they compete for the same resources residents use?

Do tourists tend to create or exaggerate peak loads on transportation facilities and City services? What are the City's costs in providing the services needed to sustain the tourist sectors of the City's and region's economies?

Policy Implications

The City has many instruments in the forms of pricing, investment, and regulation that could potentially affect the tourist industry. Where it can be shown that tourists create costs that they do not bear, taxes or fees or other pricing mechanisms can be used to correct the imbalance (the City already has a hotel tax and a gross receipts tax). Although congested facilities can be expanded, tourism may place special requirements on such services as police, transportation, and fire protection. If City services (e.g., the cable car) benefit particular enterprises (e.g., hotels and restaurants), then the costs of the service should be matched against the benefits.

Study Design

Considerable skill is needed for disaggregating income and product accounts to reveal components of tourism, and only a limited amount can be learned. A few aggregate kinds of indicators can be found (tourist days? hotel usage?), but the evidence provided is not much more than circumstantial. Two possibilities should be considered: (1) Since the sector is probably very important and almost no secondary information is available, a serious study could be undertaken to collect some original data in an integrated framework; (2) Record-keeping could be altered and additional information on number of visitors, tourist spending, and employment in tourist industries could be collected on a small (but continuing) scale to help the City gradually improve its ability to monitor the industry.

Much of the methodology of how to separate tourism as a sector would have to be developed and the direction of the study would be determined to a large extent by the indications of the preliminary data. The theoretical problem is complicated by the fact that San Francisco, in addition to being a tourist

attraction, is a regional employment center, a regional shopping center, and a major port.

Secondary Data Sources

Chamber of Commerce

San Francisco Visitors and Convention Bureau

Trade organizations

U.S. Department of Commerce, Census of Business

References

Bureau of Business Research, "Bibliography of Surveys and Statistical Reports on Tourism and the Visitor Industry of the United States" (University of Colorado, August, 1960).

William Goldsmith, "The Impact of the Tourism and Travel Industry on a Developing Regional Economy: The Puerto Rican Case," Cornell Dissertations in Planning (Ithaca: Department of City and Regional Planning, September, 1968).

Costs

A range of from \$30 thousand to \$100 thousand would be appropriate, with a sizeable proportion going to primary data collection.

Recommendations

A high priority study, although slightly less urgent than some.

A-3. MANUFACTURING

Apparently the secondary sector of the economy is declining in

San Francisco and will continue to do so. This pattern exists in most central cities, and manufacturing industries are replaced by tertiary (service) sector activities in healthy cities. One of the functions that is considered a unique contribution from central cities is the nurturing of "infant" industries--firms that are innovating, are trying to develop new processes and markets, and depend heavily upon the ready availability of goods and services that they cannot supply themselves internally. Whether this is important to San Francisco is something to be discovered.

Major Issues

What is happening to blue collar industries--manufacturing, wholesaling, warehousing--and should anything be done to keep these or similar jobs in San Francisco?

Research Questions

Is manufacturing declining and how rapidly?

What industries are the most important, and are there some that should be encouraged?

What is the size distribution of firms?

Is there a continuous process of new firms, arrivals, and departures, or simply a gradual attrition of stagnant firms without replacement?

Is there a metropolitan decentralization taking place, and what are the reasons for this process?

Policy Implications

Manufacturing tends to employ blue collar workers, and the decentralization of the industry may accelerate the flight of the City's working class or create additional hardships for them in obtaining employment. A primary function of any analysis is to assess whether there is anything the City can act upon that will alter the trends or whether it is even desirable to attempt to alter them. Possible efforts in this direction are industry tax credits, aggressive recruitment campaigns, and city-owned industrial parks.

Manufacturing shifts have land use impacts that are different from other kinds of changes that are occurring, in that land is being released rather than demanded. Hunter's Point and the warehousing activities in the southern waterfront area may present opportunities for major reuse of land.

Study Design

A number of dynamics are potentially impinging upon the traditional secondary sector (production oriented activities) in San Francisco: (1) a national decline in the relative share of secondary sector and manufacturing employment in the economy; (2) a spatial shift of major manufacturing activities to low rise buildings in the suburbs that are closer to most of their labor force and are accessible to trucking; (3) a relative decline in the number of production workers in manufacturing firms, in favor of increased supervisory and technical personnel; and (4) technological changes in the industries that reduce the amount of labor and increase the skill levels needed. If these patterns are applicable to San Francisco's industries, then it would appear to be counterproductive to try to stop or reverse these trends. A more sensible approach would be to try to find other jobs in service sector industries and encourage those industries to expand in the City. Hunter's Point represents a severe case of this conflict.

Descriptive secondary data are available in the Census of Manufactures and from the California Department of Human Resources Development. Field surveys can be used to supplement secondary sources.

Secondary Data Sources

California Department of Human Resources Development

U.S. Department of Commerce, Census of Manufactures, 1963 and 1967

References

Victor Fuchs, Changes in the Location of Manufacturing in the United States Since 1929 (New Haven: Yale, 1962).

John Kain, "The Distribution and Movement of Jobs and Industry," in John Wilson (ed.), The Metropolitan Enigma (Cambridge: M.I.T. Press, 1969).

Gerald Karaska and David Bramhall, eds., Locational Analysis for Manufacturing (Cambridge: M.I.T. Press, 1969).

Hugh Nourse, Regional Economics (New York: McGraw-Hill, 1968).

Wilbur Thompson, A Preface to Urban Economics (Baltimore: Johns Hopkins, 1965).

Costs

Because of the declining magnitude of the industry and the availability of secondary data, a minimal study could probably be accomplished for \$10 thousand and the full study for \$50,000.

Recommendations

At the moment, there seems to be considerable difference between different agencies about the underlying forces at work affecting manufacturing employment; some City agencies are writing off blue collar employment while others are actively trying to promote it. If these differences continue, then a well documented study should be undertaken. If, on the other hand, a consensus can be reached on what the trends are and their implications, then only a minimal study need be carried out.

A-4. MEDICAL SERVICES

Health, education, and senior citizen facilities are examples of personal services that are delivered largely on a regional scale and have independent patterns of expansion and spatial locations that impact City neighborhoods. Profound changes are taking place in the organization for the delivery of health services, and the interaction of historical decisions and investment with new processes is creating conflict situations for the City.

Major Issues

What are the forces behind pressures for expansion of medical complexes in the City, and are they beneficial to the City and its residents?

How can regional/City pressures to expand medical complexes be addressed while at the same time respecting neighborhood concerns over the local effects of expansion?

Research Questions

How big is the health industry and how is it growing?

Are large centralized facilities economically efficient, are they needed for research and innovation, and do they have to exist solely in large central cities?

Are health complexes creating costs for the City or local neighborhoods that they do not offset, e.g., transportation, loss of taxable land, destruction of housing?

Policy Implications

If the benefits of concentrated medical facilities accrue to a region larger than the City, yet the City bears costs for which the facility does not provide compensation, then policy should seek to control the growth of such institutions until the financial drain is corrected. Clear tradeoffs are often involved, as between hospitals and housing, and the City should know what it is gaining and losing in the process.

Study Design

The style of analysis that is appropriate to this subject area is a blend of microeconomic analysis and systems analysis. Some of the components of the problem are: (1) The kinds of jobs that are created in medical facilities and who gets them; (2) The impacts of such dynamics as unionization of health employees, job standardization, and the use of paraprofessionals; (3) The economies or diseconomies of increased scale and specialization versus the costs of neighborhood locations and the inertia of a large fixed investment; (4) The load on the transportation system -- almost exclusively auto, because of non-downtown locations -- created by the volume of workers and patients traveling to and from the facilities; and (5) The size and nature of the markets being served.

An extensive study design is unlikely to produce substantial improvements in information about this sector. More useful would be a collection of three small study efforts. First, secondary data would be tabulated concerning the magnitude, growth trends, distribution in terms of occupations, and distribution across the city's population of employment in this sector. Census and hospital administration data may be sufficient for such tabulations. Second, case studies should be conducted of the expansion problems confronted by particular facilities in the city. These studies would involve interviews with facility directors, neighborhood groups, and outside funding organizations to determine the source of pressures for expansion, the decision-making process for determining the location of expansion, the impact of expansion upon various groups (e.g., service consumers, neighborhood residents, city taxpayers, and the staff employed in the facilities), and the possibilities for ameliorating the negative impacts of expansion. Interviews would be supplemented with some analysis of changes in land values, employment, land uses, and activities within the localized neighborhoods. Third, estimates of the expected growth in the demand for and supply of health care facilities in the City and region should be obtained from Federal and state health planning agencies, so that the extent of future land use and service demands generated by this sector can be assessed.

Again, it should be stressed that this sector is rapidly changing, not only in the structure of its financing but also in the types of service delivery systems which it utilizes and thus the skill structure of its employment. Also, demand for various types of services in this sector is highly dependent upon Federal and state budgetary policies and upon the demographic structure of the population.

Secondary Data Sources

Some kinds of individual records can be obtained from some facilities, but the amount of processing required is substantial.

U.S. Department of Commerce, Census of Population

Costs

A small study of \$10 thousand could cover one or two case studies or some data tabulations, while a reasonably complete sectoral analysis should cost on the order of \$100 thousand. The first and

third studies should require roughly one and one-half man-months of DCP staff time. Various health planning agencies might well be called upon to produce most of the data required for the third study; the function of DCP staff would primarily be coordination and preparation of summaries. The second study would require roughly two man-months of staff time for a pilot effort. More extensive effort should be delayed until the value of such case studies can be assessed. for producing information that would assist the City in helping formulate policies on accommodating sector expansion.

Recommendations

At least a small scale study is a high-priority item.

A-5. RETAIL TRADE

Unlike many central cities, San Francisco has retained its viability as a regional retail center, offering high quality and specialized goods to the Bay Area. A number of factors contribute to this: the presence of an upper middle and higher income resident population, the amenities San Francisco offers shoppers, the absence of large shopping centers, tourists, to name a few. Neighborhood retail businesses have suffered fluctuations as tastes and population compositions change, but appear generally healthy at present. Here both the ethnic diversity and stable incomes are assets. This pattern, however, may be a very delicate balance which could be easily destroyed; Fillmore, Divisadero, Haight, and Market Streets suggest what can happen when conditions turn sour. If the City's generally successful retail position is to be maintained, a better understanding of the market forces at work would be valuable.

Major Issues

Is the City's retail sector uncompetitive because of transportation, access, parking, and other services?

Are neighborhood businesses suffering because of the centralization of retailing activities downtown or in shopping centers?

Are non-resident shoppers a benefit to the City?

Research Questions

What are the competitive advantages for San Francisco merchants, and are they improving or deteriorating? For neighborhood merchants?

What factors affect the City's competitive position: transportation, crime, parking, labor force, etc.?

What trends can be seen in the City's share of the market, and the mix of goods and services offered? Which components of the industry are doing well and which are doing poorly?

Does retail trade conflict with other industry, such as offices and tourism, or are they mutually supporting?

Policy Implications

It is likely that maintaining a retail market is much easier than trying to regain a lost one. Policy towards retail activities should be to refrain from destroying or altering those factors that make the existing retail market successful, while still encouraging new kinds of retailing. Intervention by the City into the private market is mostly indirect in retail activities, and takes the form of transportation, improvements to streets, sidewalks, and property, and other services to merchants and consumers.

Study Design

Two kinds of analyses can be carried out. One is to estimate the aggregate market-- whether regional or local-- and allocate shares to smaller geographic subdivisions on the basis of indicators such as personal income. Retail consumption is reasonably viewed as a pie whose overall size is fairly fixed but whose shares may be divided many different ways. The second kind of analysis is to investigate the microscopics of neighborhood retailing and what factors contribute to success and failure. Either of these studies could be carried out by the staff of the Department of City Planning.

Secondary data on retail sales are not hard to obtain, and these can be supplemented with sample field surveys and mailback questionnaires. Cash flow and market area analyses can be accomplished without a great deal of specific information, and the question of non-resident shoppers can be attacked via cost-revenue analysis. This last element is probably of marginal interest.

Secondary Data Sources

California State sales tax collections

Chamber of Commerce

Retail Merchants trade organizations (e.g., Market Street Improvement Association, Davisadero Street FACT group)

U.S. Department of Commerce, Census of Business

References

Brian Berry, Geography of Market Centers and Retail Distribution (New York: Prentice-Hall, 1967).

Leon Moses and Harold Williamson, "The Location of Economic Activities in Cities," American Economic Review, 57, 2(May 1967), pp. 211-222.

Donald Thompson, "Analysis of Retailing Potential in Metropolitan Areas," (Berkeley: Institute of Business and Economic Research, 1964).

Costs

A small study could be done for \$10-20 thousand; a full study would cost roughly \$60 thousand.

Recommendations

Enough rationale exists to justify a small study, but funding of a larger study should depend on the willingness of merchants themselves to contribute.

A-6. GOVERNMENT

Federal, state, and local governments employ large numbers of people, and create a civil service bureaucracy that can have a substantial impact on the economy of the City. If the government installations and agencies (e.g., military) depend upon outside factors that may change with sudden impact on the City (closing a shipyard), then at least the consequences of such events and their likelihood should be assessed in advance.

Major Issues

How important is the government sector to the city economy?

How vulnerable is the sector to decisions made by those outside the City on grounds that may be indifferent to local cost and supply factors?

To what extent does the government sector provide an employer of last resort for some segments of the labor force?

What are the prospects for growth or contraction in non-local government employment over the next few decades?

Research Questions

How large is the government sector, and how is it distributed between federal, state, and local levels and military-civilian?

How much of the employment is locally generated, how much expands and contracts with the general ebbs and flows of public administration, and how much is supported entirely by outside agencies and decisions?

What kinds of workers depend upon government employment, and where are they located in the City?

Policy Implications

In general, it is a good idea to know what changes are likely to have important consequences, and which of those changes may potentially be controlled or affected by the City. For most pur-

poses, much of the government sector must be regarded as autonomous, but there are some marginal exceptions and occasionally some drastic impacts.

Study Design

Since the output of government usually does not have a market price-- even when it can be given a price at all-- analysis of the government as an industrial sector concentrates on measurement of inputs. Capital costs are those for infrastructure construction, and current costs are largely labor (no rent is paid for land, for example). In either case, it is the impact of the government sector on employment that is the focus of concern. Data on government employment should be broken down according to the source of funds, including Federal, State, and local agencies; most of the data will probably have to be obtained directly from the agencies. Cross-sectional tabulations can be generated between different agencies and between the government and other activities.

An extensive study design is both unnecessary to provide the basic information on the size of this sector and unlikely to provide more reliable information on the future growth of the sector. Clearly, growth is not only the natural outcome of the locational advantages of the City for serving regional functions, but is also the result of the political leverage of the City's elected representatives and of decisions or policies which may be made by the City concerning overall population growth and budget policies. Secondary data which are routinely available from the Census and the Civil Service Commissions for various levels of government can be tabulated to reveal the magnitude of sector employment and its distribution among various population groups and types of government activity. Interviews might then be conducted with Civil Service Commissions, Federal and state agency planning offices, and political influentials to determine probable growth in various subsector employment. The staffs of elected Federal and state representatives might well be used for help in obtaining information from government agencies about possible future growth in Federal and state government employment, some of which information is clearly speculative and not for the public record.

An analysis might also be done of the trends over time in the government-employment multiplier in the City due to changes in the magnitude and distribution of the overall population and state and Federal spending. Such an analysis could use existing

secondary data. In projecting future impacts, distinctions should be made between Federal and state spending directed at regional management (central office-type) functions, at the direct provision of services to City and Bay Area residents, at defense, and at income maintenance. Each of these activities can be anticipated to have differing future rates of growth and employment and income multipliers within the City.

Secondary Data Sources

U.S. Civil Service Commission, Federal Employment Statistics Bulletin

U.S. Department of Commerce, Government Census, v. 3 "Compendium of Public Employment"

References

Roger Bolton, Defense Purchases and Regional Growth (Washington, D.C.: Brookings Institute, 1966).

George Break, Intergovernmental Fiscal Relations in the United States (Washington, D.C.: Brookings Institute, 1967).

Werner Hirsch, The Economics of State and Local Government (New York: McGraw-Hill, 1970).

David Smith, "The Response of State and Local Governments to Federal Grants," National Tax Journal, 21(September, 1968), pp. 349-357.

Costs

A small study could be carried out for \$10,000 while a reasonably thorough design would cost about \$50,000. The collection and tabulation of secondary data should take roughly one man-month of DCP staff time. The collection of forecasts of future growth and an analysis of the multipliers associated with changes in Federal and state spending and changes in the City's population would require an additional two man-months of staff time at a minimum study level and six man-months of effort in a more extended study. The estimation of multipliers might also be obtained by sponsoring a Ph.D. student in economics or planning in the writing of a dissertation with support (including computer costs) at a level of roughly \$7000.

Recommendations

Although there is not a great deal of apparent urgency for this study, events frequently occur that suddenly make the information of critical importance. The closing of a large military installation or shipyard, or ballot proposals to arbitrarily limit state expenditures provide recent examples. To some extent, analysis of the government sector could foresee many problems before they arise; others cannot be anticipated and are harder to prepare for.

A-7. CONSTRUCTION

In debate over economic growth the issue is often raised of expanded growth-related employment. The contribution to employment of the construction sector of the San Francisco economy is often cited, and forms the subject of this design. The study would examine both the number of jobs involved and whether the potential employees are likely to be commuters.

Major Issues

Are construction jobs going to non-residents?

Will the economy stagnate without construction?

Can construction employment be helped by increase in rehabilitation?

Research Questions

What number of jobs derive from residential construction work (new, rehabilitation, and maintenance)?

What percent of these employees currently live in San Francisco?

What number of jobs derive from commercial and industrial construction work (new, rehabilitation, and maintenance)?

What percent of these employees currently live in San Francisco?

What share of the resident labor force are dependent upon construction activity in San Francisco?

Policy Implications

This study begins to address the question of who benefits from increased levels of expenditure for construction. More complete coverage would include an analysis of the unemployed of San Francisco and the region to see if they are provided jobs by new construction activity. The credit structure for financing maintenance and rehabilitation of existing structures is also a crucial variable and is examined in Study N, "Housing Rehabilitation and Conservation".

Study Design

A special cross-tabulation of 1970 census material by place of employment (i.e., San Francisco) occupation (i.e., all construction-related trades), and place of residence (i.e., San Francisco versus other counties) may be possible and if so would establish aggregate levels of the chief variables for the year 1970. To up-date these figures and divide them between residential and non-residential construction activity requires data on total investment in each of these and expenditure/labor ratios for both. Interviews with union officials and contractors might supply the latter. Aggregate statistics on the former have been published for San Francisco County up to 1970 by the Research Division of Security Pacific Bank. They also publish a monthly tabulation of building permit activity divided conveniently into various commercial categories and one residential catchall category which could be used for more recent figures.

Two courses of action suggest themselves for estimating the percentage of commuters. The 1970 census material can be accepted as adequate for the purposes of this study, without determining the split between residential and all other construction; or, questions on place of residence and type of construction being done could be incorporated into a direct survey, perhaps in combination with a general survey of commuters in the San Francisco work force. This later effort is hardly justified by the aims of this study alone; a survey of the percentage of commuters by occupation is discussed further in Study Number F, "Relation of Industry to Employment."

Secondary Data Sources

California Department of Human Resources Development

City of San Francisco Building Permits Office

San Francisco Building Trades Council

Security Pacific National Bank, Monthly Report of Building Permit Activity in the Cities and Counties of California

U.S. Department of Labor publications

References

U.S. Department of Commerce, Construction Review

Costs

Processing of census material and cross tabulation using all areas within commuting distance of San Francisco could cost as little as \$5,000, while a large-scale survey of selected occupations to determine percentage of commuters (depending on size of survey) would cost from \$30,000 to \$40,000.

Recommendations

In the long run, the level of construction activity in San Francisco need not be linked to economic growth per se; i.e., rehabilitation and maintenance could be greatly expanded by alternative credit plans (see study design N, "Housing Rehabilitation and Conservation"). Although a lively topic of debate, this empirical study is not likely to uncover too many surprises, especially if hard data on commuting construction workers proves to be unavailable. Therefore, the large-scale version of this study is of low priority at this time.

B. PROPERTY TAXES, LAND VALUE, CONTROLS, NEIGHBORHOOD EFFECTS, AND LAND USE

The single fiscal instrument currently in use by the City that has some potential consequence for development patterns is the property tax. No other local tax is of either the magnitude or the form to cause significant disturbances in private market activity. The impact of the property tax on land use is indirect, in that the tax affects land value which in turn affects intensity of land use. Land use controls -- zoning, height limits, Bay fill restrictions -- may also have an impact on land values indirectly as well as on land use directly, making for a complex web of interrelationships.

Major Issues

Do current tax and land use controls tend to encourage or discourage downtown commercial growth?

What would be the property tax and growth consequences of a drastic limitation on building height?

Is there some kind of domino effect from highrise development that tends to reinforce itself?

Research Questions

What effect does the property tax have on land value?

How do zoning and height limitations affect land value?

Do highrise developments create a neighborhood effect that makes adjacent non-highrise development uneconomic?

Policy Implications

The City and the Planning Department are involved in the real estate market in a large variety of ways. Some of these are intended and some are side effects of other policies (such as obtaining general revenues via the property tax). In either case, the effects of the current policies should be better known, and proposed policies evaluated in the light of the likely impacts on development.

Study Design

Because of the microeconomic character of the structural relationships and their complexity, a case study methodology is likely to have the highest yield. A set of specific sites representing the variety of conditions that are of interest should be selected, and the techniques of real estate economic analysis applied to them. Figure 4 shows a schematic outline of the theory that would have to be constructed, covering the following elements:

- (1) City Expenditures and Non-Property Tax Revenues. The property tax being a residual tax, it is obtained by subtracting revenues from expenditures and dividing the result by the relevant assessed valuation; the result is the
- (2) Tax Rate. *Ceteris Paribus*, the tax liability is capitalized into the value of the property, providing one of the many factors affecting property value. Some of the others are
- (3) Services. City expenditures support a range of services that benefit properties both directly and indirectly and hence influence property value;
- (4) Market Demand. Aggregate demand for the output of various activities is exogenous for this study;
- (5) Location Factors. Access to other locations of interest through proximity and the transportation system translate aggregate demand into land prices at various locations;
- (6) Land Use Controls. Both land use and land value are affected by government regulations and incentives; and
- (7) Political Climate. In the purchase of any specific site, the buyer usually estimates the probability of obtaining various permits, special exceptions, variances, zoning changes, etc., that would increase the income producing potential of the property. This network of influences establishes the
- (8) Property Value. The "highest and best use" is that economic activity which can pay the highest land rent for the site, determining the
- (9) Land Use. Significant changes in land use or intensity of use at one site then set in motion pressures for higher intensities at adjacent sites, creating
- (10) Neighborhood Effects. These in turn affect property

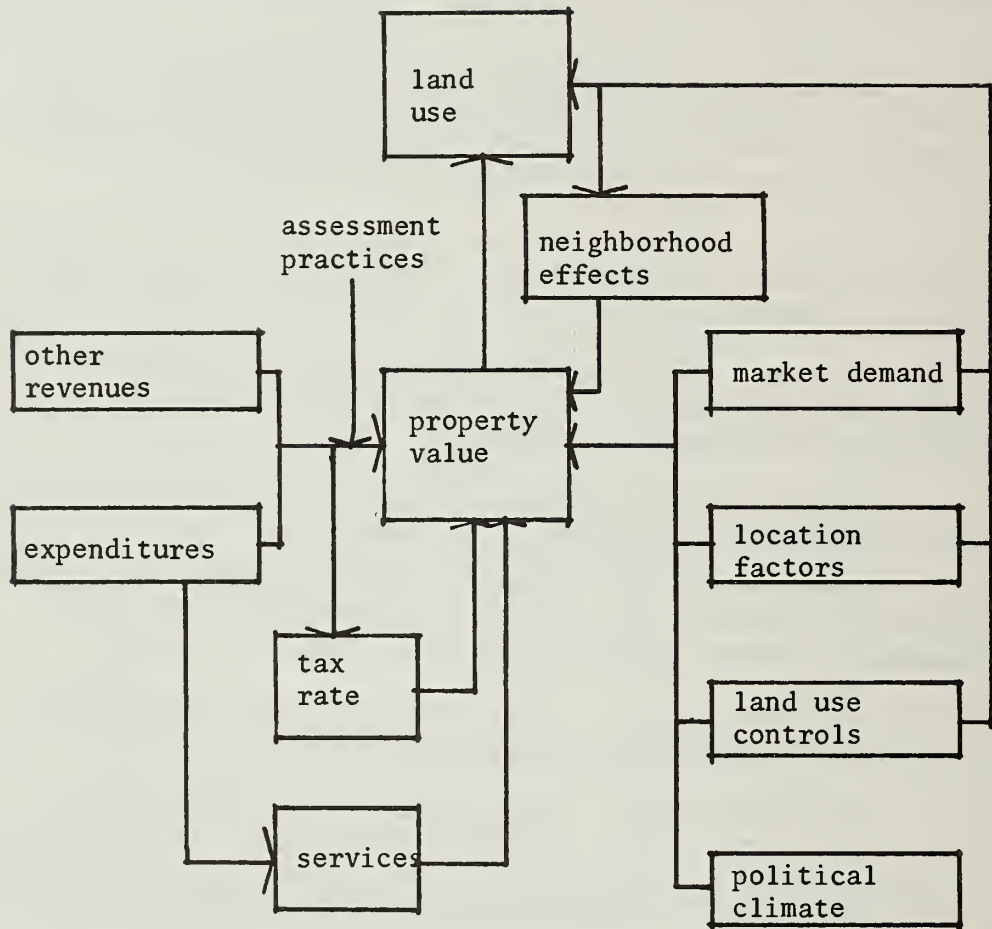


Figure 4. Schematic Structure of Property Tax, Property Value, and Land Use Relationship

values and, indirectly, tax yields.

Assessment of real property by the City is a part of the process by which the need for additional general revenues is spread over different property owners. To the extent that there are biases and distortions in assessment practices, income transfers occur between property owners and incentives are created that encourage some uses and discourage others. If systematic distortions can be found, then efforts should be made to offset or correct them. Since the passage in 1966 of AB-80, requiring an assessment ratio of 25% throughout the state, coupled with the monitoring of assessments by the State Board of Equalization, random and systematic deviations caused by particular individuals or specific policies has been greatly reduced. This does not mean, however, that assessments necessarily reflect true market value in an accurate manner.

Secondary Data Sources

City Assessor

City Controller

City Planning Department

City Tax Collector

Henry George Foundation

References

Werner Hirsch, The Economics of State and Local Government (New York: McGraw-Hill, 1970).

Douglass Lee, et al., Case Studies, Volume III, Land Use and Investment Study, BART Impact Studies (Berkeley: Institute of Urban and Regional Development, June 1973).

Wallace Oates, "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis," Journal of Political Economy (November-December 1969), pp. 957-971.

Stafford Smith, "Property Tax Capitalization in San Francisco," National Tax Journal, 23 (June, 1970), pp. 177-193.

Deborah Wiech, Market Street Study, Volume IV, Land Use and Investment Study, BART Impact Studies (Berkeley: Institute of Urban and Regional Development, June, 1973).

Costs

This study is a complex and difficult one, but capable of producing fundamentally useful results; success would depend upon the services of a skilled interdisciplinary team. Probably the best way to approach the study would be to first undertake a pilot study to refine the theory, develop a robust experimental design, and make some trial runs on the data and the methodology--and then carry out a full scale design. Estimated cost for the first phase is \$25 thousand; the follow-on study should cost roughly \$50,000, including a good deal of data collection and processing.

Recommendations

The first phase is of moderate urgency, but is central to the highrise debate and would greatly improve the level of that debate.

C. TRANSPORTATION AND THE GROWTH OF THE CBD

The intensity of use that can exist in the central core may be constrained by transportation facilities that do not have the capacity to move the volume of people and goods into and out of the core that are needed to sustain the high level of intensity. One hypothesis is that BART will provide this additional capacity--which the auto could not deliver to the existing spatial configuration of the City--and that the effects of this investment have already been felt.

Major Issues

Has BART stimulated high intensity highrise development of downtown San Francisco?

Have limitations in the City's freight transportation system contributed to the contraction of manufacturing and other sectors?

Research Questions

What evidence is there that the demand for downtown trips would increase if there were greater capacity? Have existing systems reached saturation levels?

Does BART provide substantial benefits to downtown San Francisco, and have the benefits been capitalized into land values and reflected in new investment?

What will be the secondary impacts of growth in transportation and shifts in transportation modes?

Policy Implications

Transportation is almost entirely dependent upon the public sector for investment in capital facilities, and decisions have many repercussions in other sectors of the economy. Citizens have strongly expressed positions opposed to freeway construction, while BART is also criticised for the kinds of economic impacts it represents. There is the possibility of taxing increments in land value due to expanded transportation facilities, but it is difficult with current methods to separate out such increments and measure them.

Study Design

Three time periods with respect to BART impacts can be delineated: a pre-BART period before the decision was made, an intermediate period between the time of the announcement of future construction and the time of full operations, and the period after the point at which full operations begin. During the intermediate period, property values can be expected to increase more rapidly in anticipation of benefits from the rapid transit system. If the benefits created for a particular property

are insignificant or less than capitalized costs in property taxes and disruption, then property values will not rise and land use intensity will not increase.

Although the outlines of the theory can be simply presented, quantification of the concepts has not been effectively accomplished yet. In an environment as complex as downtown San Francisco, clearly a simple before-after framework is useless. In fact, it is necessary to forecast what the most likely state of the environment would have been without BART in order to make any comparisons. Thus the problem requires the macroeconomic analysis of demand conditions (such as that proposed in Study Number 1), a strong theoretical structure build on real estate microeconomics, and a robust empirical design.

Data requirements include such items as real property market transactions, land and building square footages, rental prices, construction costs, aggregate person trip-ends in the downtown by mode, transportation user costs, etc., as well as the macroeconomic trends of the local economy. All data need to be collected over some period of time. Real estate cash flow and financial analysis of these data should be combined with empirical testing of partial equilibrium models using multivariate techniques.

Freight transportation is a separate subject for analysis, but may be contributing to pressures that discourage the retention of manufacturing employment in the City. Actual or estimated costs for transportation can be generated for different kinds of firms in different locations, both within the City and outside. If cash flow analyses of firms that consume freight transportation show that these firms are being systematically encouraged to leave the City, then action on the part of the City may be called for to offset the biases.

Secondary Data Sources

City Assessor

City Building Permits Office

Construction reports (e.g., Pacific Builder)

Real Estate Research firms and Tital Insurance companies

References

Douglass Lee, et al., Case Studies, Volume III, Land Use and Investment Study, BART Impact Studies (Berkeley: Institute of Urban and Regional Development, June, 1973).

Deborah Wiech, Market Street Study, Volume IV, Land Use and Investment Study, BART Impact Studies (Berkeley: Institute of Urban and Regional Development, June, 1973).

Costs

The study is a difficult one and requires a great deal of original data collection or processing of secondary data, so even a modest study design will cost \$35 thousand, whereas a full scale study would cost at least \$100 thousand.

Recommendations

The thrust of the issue is more structural than policy analysis, and the audience for the structural question is much larger than the City of San Francisco. MTC is in the process of funding a series of large-scale BART Impact Studies, and at some point these questions should be addressed. The important consideration for the City is to keep contact with the studies and provide substantive inputs to the designs.

D. FISCAL IMPACTS OF TRANSPORTATION

A particular mix of economic activity along with the work force associated with each industry plus the population supported by this work force imply a set of transportation demands which can be met in a number of ways. The two most important future transportation system alternatives are (1) the system that will result given current policies or the most likely future policies,

and (2) the system that would serve the future economy and population in the most efficient and equitable manner. The differences between these two alternatives will be felt most heavily in the City budget, although there are also numerous external effects that differ under the two assumptions.

Major Issues

Are San Francisco taxpayers subsidizing transportation for other people?

Research Questions

What patterns of freight and passenger transportation will exist in the future, and what would be a better arrangement?

What costs will increase to the City given current trends in economic activity and population distributions?

Policy Implications

There is growing evidence that all forms of urban transportation are heavily subsidized from the user point of view, and these hidden costs will surely affect the City budget even more strongly in the future than they do now. Unless the City wants to accept the burden of supporting a large amount of transportation services out of general revenues, a substantial reorientation of policy is called for.

Study Design

Concepts can be taken from the techniques of microeconomic analysis. A variety of assumptions are necessary to derive numerical estimates, but a basis for comparing alternative transportation patterns can be obtained quite readily. Costs depend not upon a simple budget or expenditure notion, but on measuring marginal or incremental costs according to the decision horizon that is appropriate.

Secondary Data Sources

Budget data from Bay Area transportation and other agencies

Cost studies from other cities

References

Douglass Lee, Theodore Keeler, and Leonard Merewitz, "Comparative Costs of Urban Transportation," NSF Grant (Berkeley: Institute of Urban and Regional Development, forthcoming).

John Meyer and Mahlon Straszheim, Pricing and Project Evaluation (Washington: The Brookings Institution, 1971).

Costs

A minimal study could be accomplished for \$10,000, and a full scale study would cost about \$100,000. The services of a qualified transportation economist would be necessary.

Recommendations

The minimal study should be undertaken within the next six months, since major changes in travel patterns and transportation investment will appear shortly. BART and Muni are the major concerns here. A large-scale study should follow the small one, if support from MTC can be obtained (they will not be carrying out either of these studies, although their efforts will certainly have some bearing on them).

E. REQUIREMENTS FOR CITY SERVICES

Commercial development is justified by some on the basis of additions to the City tax base, and opposed by others on the basis of service costs. To fully answer the question of whether commercial properties contribute more to the City budget than

they require in services or vice versa necessitates making arbitrary allocations of some costs and estimating secondary effects, either of which makes the study practically undoable. A more reasonable question is to try and identify special costs that can be directly attributable to commercial properties or highrise buildings in particular.

Major Issues

Do highrise buildings create more in service costs for the City than they contribute in taxes?

Research Questions

Are there specialized services that can be directly attributed to specific kinds of commercial property?

Can these costs be measured and evaluated, such that user charges might be levied on those properties that create the costs?

Policy Implications

An example of the type of service that might be considered is putting out fires in highrise buildings. There is some evidence to indicate that this is an unusual problem for which a resolution is not apparent. If the risk to life is significantly greater in the upper floors of tall buildings, then steps should be taken to reduce that risk. One way may be to develop special firefighting equipment and techniques that work effectively under conditions in tall buildings, and then these special costs could be separately charged to the properties receiving the protection. It might be cheaper, however, to require sprinkler systems and other building code constraints that would replace the need for the special firefighting capability.

Study Design

Two methodological strategies can be employed, reflecting slightly different policy concerns:

(1) Cost/Revenue Analysis. The procedure is to identify those services that can be assigned to specific types of properties, measure the incremental or the average costs of those services, and compare the costs with the revenues generated by those properties that can be allocated to providing the services. This approach provides only a partial answer to the issue, and still contains a considerable degree of arbitrariness.

(2) Cost-Effectiveness Analysis. Probably a more fruitful strategy is to ask--as in the fire problem mentioned above--for the most cost effective way to provide the service. How to finance the service then becomes a subsidiary question. One information source to start with would be members of City agencies that might potentially have problems with commercial buildings.

References

Bruce Bruggmann, et al., The Ultimate Highrise: San Francisco's Mad Rush Toward the Sky (San Francisco: Bay Guardian Books, 1971).

Alvin Drake, et al., (eds), Analysis of Public Systems (Cambridge: MIT Press, 1972).

Gruen, Gruen and Associates, Four Working Papers on the Economic, Social and Fiscal Effects of Highrise Buildings in San Francisco (San Francisco: Gruen, Gruen and Associates, August, 1971).

Roland McKean, Efficiency in Government Through Systems Analysis (New York: John Wiley, 1958).

Costs

A small study could be done for \$5,000 while a full scale study should be around \$30,000. Most data would be original, but in the nature of engineering estimates.

Recommendations

Attention should be concentrated on those services for which there may be a special demand created by various types of commercial property. A few--such as fire fighting--may be urgent if there seem to be serious deficiencies in the services currently provided, but the general question is probably of limited interest.

2. JOBS

1
ECONOMY

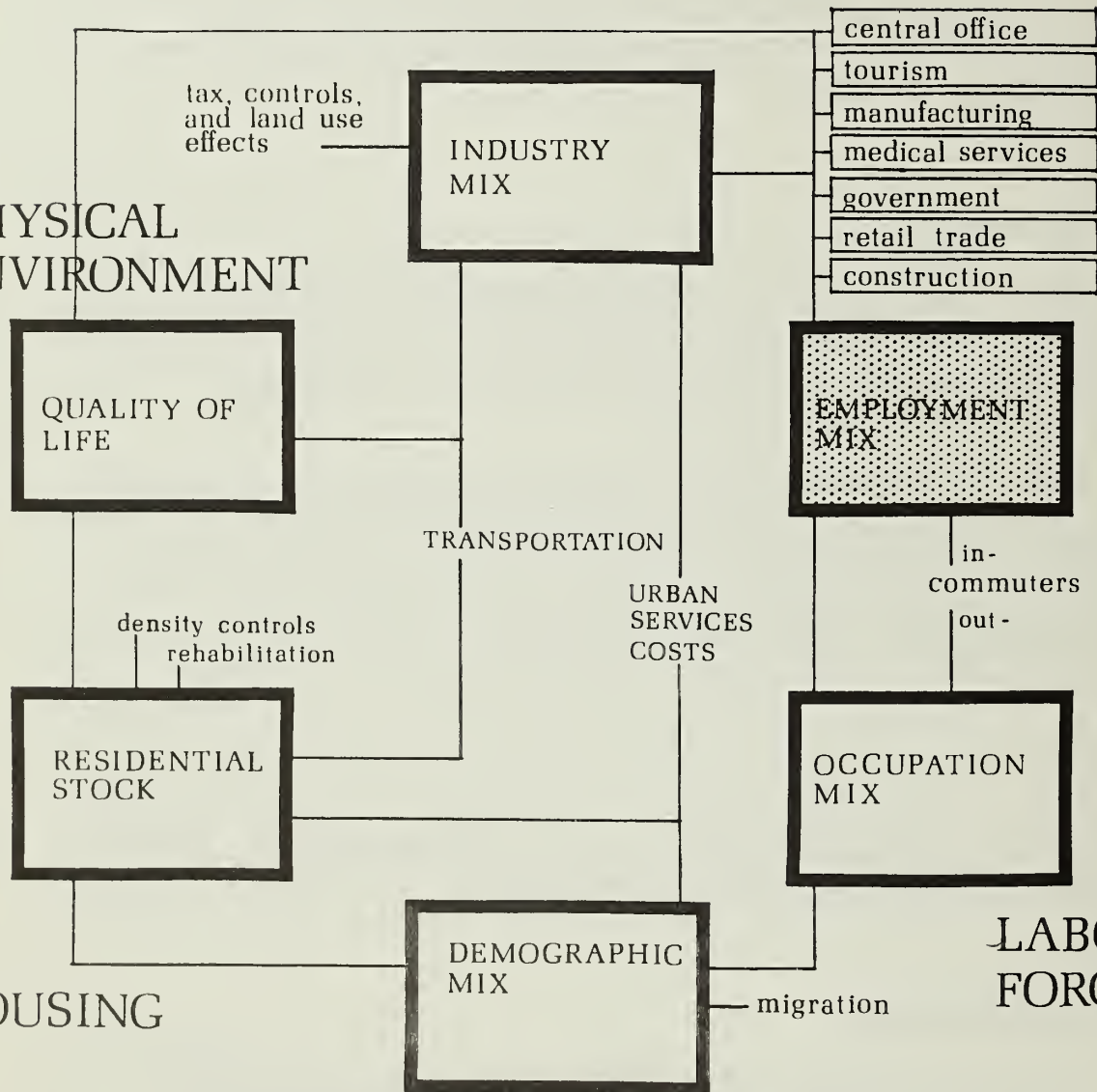
6
PHYSICAL
ENVIRONMENT

2
JOBS

3
LABOR
FORCE

5
HOUSING

POPULATION
4



There is a tendency in the popular mind to equate economic growth with jobs, as if the economy were synonymous with employment. Failing to acknowledge the relationship between the demand for output and the derived demand for labor not only misses the importance of non-labor inputs in the local economy, it ignores the process by which jobs are created. The first group of studies looked into the sizes and shares of various industries and sectors in the economy; the next study asks how those magnitudes are translated into jobs, and the following study asks whether or not local residents are likely to participate in those jobs.

Moving from the economy to jobs leads to the derivation of the local demand for labor, which may--as in the case of San Francisco--draw from a regional market. The next link in this structure is the supply of labor that is available locally, and this matching up is the subject of both this section and the third group of studies. In-commuters make up the difference between the demand for skills and the local supply, while out-commuters represent the excess supply of certain skills groups. Inevitably there is a good deal of cross-hauling, which allows for different tastes and information regarding residence locations and kinds of jobs, but the orientation of the two studies in this section is toward systematic patterns in what kinds of jobs are offered and who gets them.

F. RELATION OF INDUSTRY TO EMPLOYMENT

An important consequence of economic trends is their impact on employment. Assessing the overall employment opportunity picture for San Francisco involves both secondary sources and employment profiles for businesses known to be expanding or contracting. Emphasis in this study is on assessment of the quantity and types of jobs that are being offered in San Francisco, i.e., the demand for labor.

Major Issues

Does growth create jobs for San Francisco residents?

Does growth mean more commuters?

Does growth mean more high skill jobs at the expense of low skill jobs?

Research Questions

What are the current trends in employment in San Francisco insofar as they can be determined from available secondary data?

What are the employment profiles and percentage of commuters in the expanding sectors?

What are the employment profiles and the percentage of commuters in the declining sectors?

Based on current trends, what changes are likely in the size and occupational mix of the work force? of the commuting work force?

Policy Implications

Advocates of growth frequently use the argument that growth means more jobs. The DCP can deal more intelligently with this contention if it has more specific information regarding how many and what kind of jobs are likely to flow from what kinds of growth. If potential employment is to be one criterion in policy decisions, they can be more focused if more specific and accurate information is available.

An important consequence of employment patterns is commuting. The 1970 census showed a steep increase in the number of commuters, matched by a decline in the number of San Franciscans employed in San Francisco. The SPUR study estimates that between 1960 and 1970 commuters increased by 53.3% while the number of San Franciscans employed in San Francisco declined by 9.4%. As Figure 5 shows, a linear extrapolation of this trend would indicate a 1980 work force of about 50% commuters. While this extrapolation is purely speculative, it does highlight certain policy considerations. If this trend is seen as undesirable, then policies should be instituted to alter it. If, on the other hand, the trend is seen as either desirable or inevitable, then perhaps some reorientation is in order with respect to what the city government's services should be and who should pay their costs.

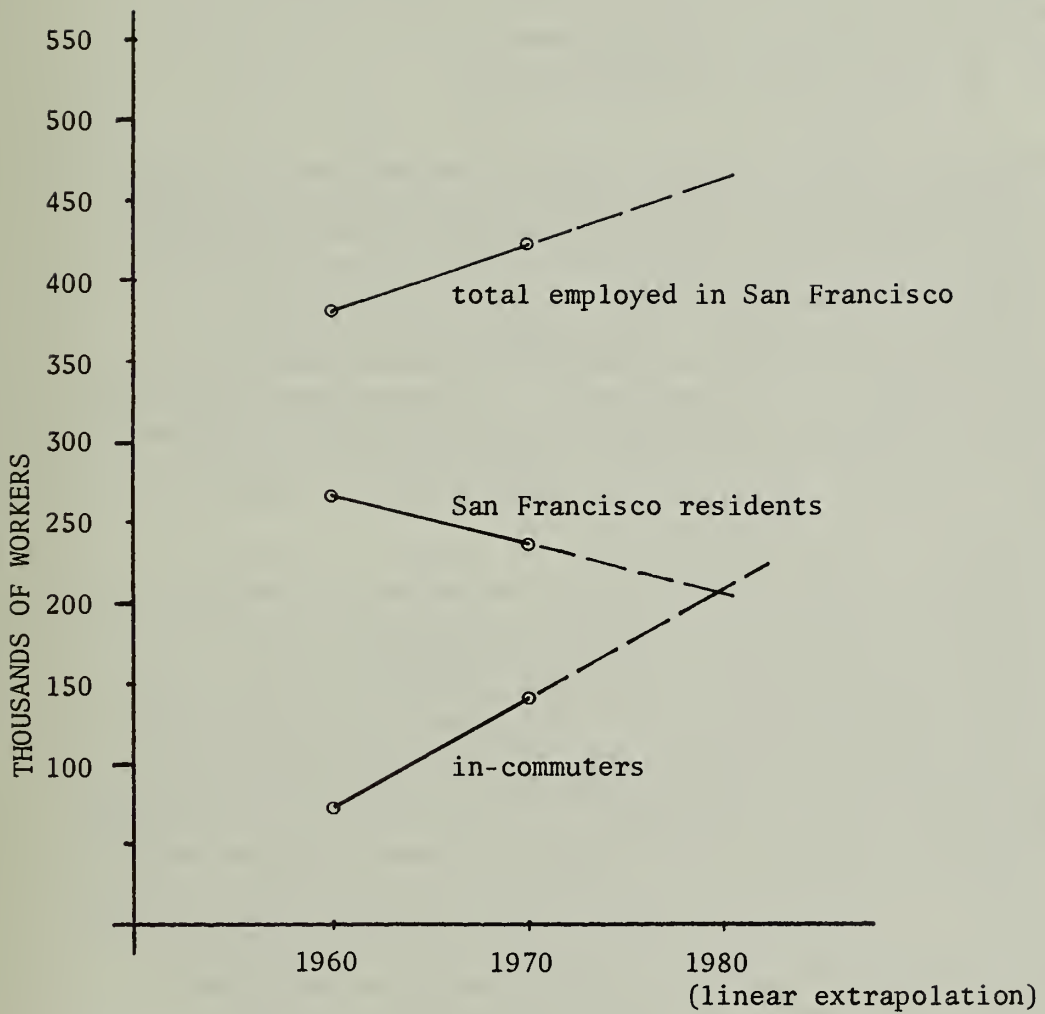


Figure 5. Trend in Total Work Force and Commuters

sources: U.S. Census; SPUR Highrise Study

Among the policy areas to which the results of this study would apply are transportation demands by commuters; allocation of the costs of facilities; employment for residents; allocation of social service costs; provision of housing for workers; and tax policies toward commuters.

Study Design

This study design will consist of three parts: an examination of secondary data with some evaluation of the sources, a survey of occupational characteristics of employees of selected firms, and an attempt to develop some indices that will be helpful in evaluating growth alternatives.

(1) Secondary data. The most helpful secondary data source is the Bureau of Census publication County Business Patterns. It has been published at varying times since 1946 and annually since 1964, and lists employment and payrolls for Counties by industry. Figures represent the status at the end of the first quarter of each year. Employment covered in the report represents about 75% of FICA covered employment, which in turn is about 90% of all employment. An interesting additional piece of information is the number of reporting units (firms) in each of several size categories for each industry. We suggest a careful analysis of the figures in this source to determine trends in employment.

Our research indicates that there is no reliable decennial census data for employment by place of work and that such data could be derived only at the most aggregate level. To the extent that such data can be obtained by estimate, it is available in the SPUR High-Rise study (1-B, 111, pp. 168-71), but the estimating techniques were not outlined in the study. At the present time the San Francisco office of the Bureau of Labor statistics is preparing a report on places of employment by place of residence, but the project is receiving low priority.

Statistics on employment covered by the California Unemployment Insurance code are available from the Division of Employment of the California Department of Human Resources Development. The exclusion of many jobs from coverage limits the usefulness of these data. The Department's Area Manpower Review contains some helpful data. Certain cautions should be observed when using available data on employment. First, data from one source should not ordinarily be compared with data from another source without careful examination of the collecting

procedures for each case. On the other hand, data from the same source for several points in time can be easily compared to determine trends. Second, most employment data count jobs rather than workers, which means that if a person has two jobs he or she will be counted twice. Third, attention should be given to the collecting procedures to determine whether there is a bias that would tend to exclude certain kinds of jobs. Fourth, listings of employment by Standard Industrial Classification Code can be misleading because they make no distinction between central headquarters employees and production employees. In some cases it is occupation data rather than industry data that is more informative.

(2) Survey of firms. When some determinations have been made from secondary data with regard to trends in employment by industry, sample firms should be selected to represent the major trends. A survey should then be done to gather information on the occupational characteristics and commuting patterns of employees of those firms. Although personnel matters are not open to the public, data about employment of some firms by occupations category may be obtainable with their cooperation. They might also be willing to furnish home addresses by city and/or allow interviews to determine commuting habits. We do not recommend simply using the 1965 Bay Area Transportation Study Committee data for this survey because the sample was not designed to yield reliable data at the city level, and there has been some question regarding quality control in the interviewing process.

(3) Development of indices. The employment factor in growth decisions has not heretofore been approached with a great deal of accuracy and objectivity. This problem could be greatly relieved if a set of simple indicators could be developed for analyzing various industries and their employment-investment patterns. Possible indices include job creating propensity of an investment dollar, propensity to employ residents, space consumption per job, land consumption per job, jobs per dollar of output, propensity to employ certain skill levels, etc. It is not evident a priori what indicators will be most helpful and some interaction with the data will be necessary to make this determination.

Secondary Data Sources

Division of Employment, California Department of Human Resources Development, Community Labor Market Survey

Real Estate Research Corporation, Survey of Loop Employment, Chicago Community Renewal Program, 1963

Security Pacific National Bank, San Francisco Bay Area Report, 1971

SPUR Report, Part 1-B, Volume III

U.S. Bureau of Labor Statistics, Employment and Earnings Bulletin (monthly)

U.S. Department of Commerce, County Business Patterns

U.S. Department of Commerce, U.S. Census of Population

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Costs

Assembling the available secondary data, tabulating it, and perhaps generating some additional indicators could be done fairly easily and should not cost more than \$5,000; a preliminary survey should establish the fact that this has not already been done satisfactorily before starting a new study. A study which would collect some original data on downtown employment and space consumption could be accomplished for \$50,000.

Recommendations

The small study should be carried out because it can be done so easily and would provide obviously basic data; the larger

study should also be given high priority, for similar reasons. While the cost is higher, the data are clearly central to a satisfactory understanding of the City's employment picture and the data can be readily obtained by direct means.

G. FISCAL IMPACTS OF COMMUTERS

It is often claimed that commuters create burdens for central cities that they escape by living in the suburbs, where they cannot be taxed by the central cities. San Francisco once attempted to tax commuter payrolls, but failed to establish an adequate basis for legality. Although the question is a very complex one, it is typical of a large number of issues which arise apparently from the fragmentation and layering of political jurisdictions but which, in fact, are much more fundamental.

Major Issues

Do commuters cost the City more than they contribute?

Are commuters generally beneficial to the economy of the City?

Do commuters escape their share of the load by living in the suburbs?

Research Questions

What are the costs and revenues of commuters to the City fisc?

What secondary effects to commuters create, and are they negative or positive?

Do policies towards commuters encourage a polarization of population groups?

Policy Implications

A number of policy concerns are tied up in the commuter question: (1) Actions taken by the City government should be reviewed for their impact on encouraging or discouraging commutation in general and particular commutation patterns; (2) Where direct costs and revenues can be identified and a deficit documented, then a basis for user charges is established; (3) If commuters can be shown to create negative side effects, then the side effects should be corrected rather than attempting to discourage overall commuting; (4) To the extent that problems are imposed on San Francisco by forces outside its control, a basis is established for lobbying efforts at the regional, state, and Federal levels.

Study Design

A cost/revenue analysis of costs versus contributions toward those costs would form the general methodology to be employed in this study, but the concepts used to define costs require careful attention. Neither the theory nor the data are currently structured in a directly applicable way. Some of the considerations in developing this study are:

(1) Direct versus Indirect Costs. Costs which can be directly attributed to commuters, such as traffic police, parking, air pollution, congestion, etc., are potentially more measurable than those that are less direct. None of the costs, however, can be easily measured, which means that very indirect costs are extremely elusive. Working against this strategy--deal only with measurable direct costs--is the opposite concern which claims that it is precisely the indirect costs that are the most important. The claim is made that commuters do not shoulder their fair share of general services such as education and cultural facilities (to the extent they are not self-supporting) nor of redistribution costs such as welfare, public assistance, and the assimilation of immigrants and low income population groups. This latter view is premised on the belief that San Francisco provides these kinds of functions for the region as a whole, and hence the region ought to share in the costs. Concentrating attention on direct costs implies that the purpose of the analysis is to correctly establish user charges; concentrating on indirect costs has implications for tax policy and revenue sharing.

(2) Total, Marginal, and Incremental Average Costs. Even if all the numbers required were immediately available, the idea

of what a cost is still needs to be determined. The total cost approach says account for all costs, compare them with revenues (or benefits), and allocate the residual. Thus the cost of traffic police can be debited against gas tax contributions and the costs of bus operations compared with receipts from the farebox. Problems occur particularly when dealing with secondary effects - parking, for example - in which the error in estimating costs and revenues may greatly exceed the difference between them. A better method to follow in that case is to assume that charges to the user cover all private costs borne by entrepreneurs, and then to add in only those costs that are clearly outside any market. Examples might be the cost of land in streets and the cost of air pollution.

Marginal costs are those which could be avoided if the last unit of output (i.e., the last commuter) were foregone. The point here is that all other costs are fixed and "sunk", and should not be counted. Carried to an extreme, the concept is devoid of value, but applied more generally the idea of marginal cost suggests some important distinctions. If the transit system is going to operate anyway, then there is no reason to charge any user more than the costs the individual user creates - the deficit must be made up in some other way. If user charges are the primary policy concern, then marginal costs (appropriately defined) constitute the information needed. It is also necessary to keep track of how revenues are channelled to pay for costs (e.g., gas tax revenues make no contribution to the police budget). Paying for non-marginal costs, if there is a deficit, is then a separate problem.

Incremental average costs are a compromise between total and marginal costs, in that they are usually aggregated over a group of users (commuters) on the assumption that each individual should pay an equal share of the total. Costs are incremental both in the sense that they are avoidable over some period of time and that they are the difference between direct or assignable costs and revenues.

(3) The Budget Entity. A final consideration in establishing a cost/revenue study of anything -- including commuters -- is the specific identity of the implied transaction. Often the City budget is taken, for simplicity, but this account excludes many important transactions that may be of interest: air pollution, amenities, opportunity costs of land and structures, property value and noise impacts of traffic on neighborhoods, etc. Alternatively, a completely general social cost and benefit framework may be ethically elegant, but it fails to reflect the realities of policy making and may obscure important income transfers from one group of people to another. The net result is that the question of whether commuters carry an adequate share of the

costs must be addressed through a multiplicity of accounting frameworks rather than by any single overall accounting system.

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Harley Hinrichs and Graeme Taylor, Program Budgeting and Benefit-Cost Analysis (Pacific Palisades, California: Goodyear Publishing Company, 1969).

Woo Sik Kee, "City Suburban Differentials in Local Government Fiscal Effort," National Tax Journal, 21(May, 1967), pp. 183-89.

Woo Sik Kee, "Suburban Population Growth and Its Implications for Core City Finance," Land Economics, 43(May, 1967), pp. 212-11.

Ruth Mace, Do Single Family Homes Pay Their Own Way?, Monograph No. 15 (Washington: Urban Land Institute, 1968).

Selma Mushkin, ed., Public Prices for Public Products (Washington: The Urban Institute, 1972).

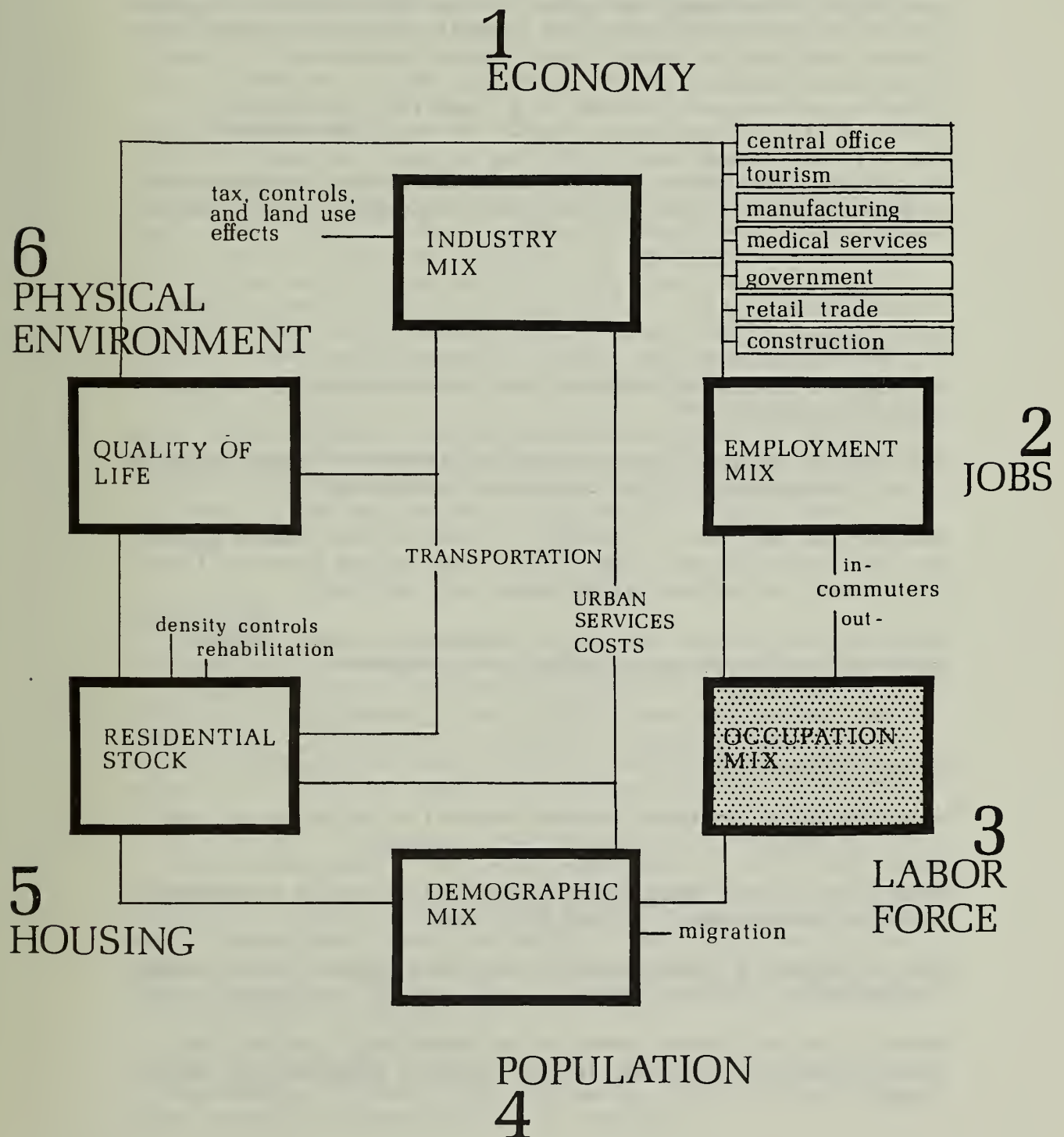
Costs

The study should be broken into two stages: the first should be a pilot study that develops a theoretical but policy-oriented framework for analysis, proposes a complete study design, and makes sufficient tests on the data and methodology to assure that it works --to cost \$25,000; and a second phase that would collect information on a substantial scale, preferably on a continuing basis, and would cost up to \$100 thousand.

Recommendations

Both the topic and the methodology for analysis are of crucial importance, and high priority should be given to carrying out a serious pilot study. Policy implications are extensive, and the results would have widespread significance.

3. LABOR FORCE



H. CHARACTERISTICS OF THE SAN FRANCISCO LABOR FORCE

The impacts of economic growth on San Francisco residents depends both on what jobs are offered and on what characteristics are available in the supply of labor. It is likely that the supply of jobs is determined largely by general and local economic conditions but also by certain labor supply factors such as unionization and the availability of workers who are residents of the City for non-economic reasons (e.g., marriage, preference). There is also a significant minority of residents who live in the City and commute out of the City to work; for some this may be the preferred situation and for others it may be because they cannot find work in the City or else they cannot find residence outside.

Major Issues

What ability do local residents have to take advantage of jobs offered in the City?

How well do the jobs offered in the City match the characteristics of City residents? Is the divergence increasing?

Who get the new jobs? Is there a systematic bias toward replacing low skill jobs with high skill? Does growth have any favorable impact on residual unemployment and the poor?

What implications for the City's educational system, manpower programs, etc., can be drawn from the patterns?

Research Questions

What are the occupational characteristics of employed San Francisco residents? Of the unemployed residents?

What is the labor force participation rate? Can it be disaggregated by sex and age? By race or income?

How do household characteristics vary with respect to the worker characteristics of the head?

What is the statistical trend in out-commuting? Can this be broken down by occupation, income, race, or neighborhood/census tract?

What percentage of employed San Franciscans have moved into San Francisco within the last five years?

What is the potential "output" of the San Francisco school system each year into the resident work force?

Based upon current employment trends, what changes are likely in the size and occupational mix of the resident work force?

Policy Implications

At one extreme is the conclusion that structural unemployment is the cause of joblessness in San Francisco, and only very small impacts can be made on this problem; at the other extreme is the belief that any growth will improve the employment picture for all resident workers, and no selectivity needs to be exercised. In between lies a range of policy options: upgrade the school system if local high school graduates cannot compete; support manpower retraining programs if workers need to adapt to new industries; encourage industries that provide employment that will use and upgrade the skills of local workers; choose industries which generate a lot of employment relative to their demands for capital, physical infrastructure, land, etc. The mix of policy instruments depends upon the substantive information that can be obtained from this study and the related ones.

Study Design

The quality of secondary data is relatively good with respect to the characteristics of workers by place of residence, and these data can be supplemented by more specialized sources that cover unemployment, job placement services, manpower programs, vocational and other educational services, and special population groups. Two levels of study can be undertaken:

(1) Data Tabulations. The Census describes the employment status of residents, which can be expanded to include special tabulations of data not readily available from second and fourth count print-outs. Occupational trends for employed San Franciscans can be found in the Department of City Planning report San Francisco 1970 Census Summary and Analysis Part II (pages 23-25). Additional data that might be helpful are:

- labor participation rates for males, females and each race
- relationships between income and family size of households and the occupation characteristics of the head

- occupational characteristics of out-commuters
- income characteristics of out-commuters
- neighborhood source of out-commuters
- percentage of employed San Franciscans in each occupation group with 1965 address outside San Francisco
- number of new entrants into labor force from school system
- all of the above data by census tract and/or neighborhood

It is important to hold this study to standard definitions for such items as "labor force participation rate," to allow for comparisons with previous census years. Since out-commute statistics exist only for the 1960 and 1970 census counts, any "trends" in the size and characteristics of this group depend upon simple linear extrapolations which have little predictive ability. But even establishing a good estimate of the absolute size of this group and some of its characteristics in 1970 will be useful.

(2) As the tabulations identify particular groups of workers that seem to be important, additional data and special surveys can be incorporated. Potential sizes of different worker groups in the future are implied in the current age structure of the population combined with future migration patterns; these can be satisfactorily forecasted for at least the short run. The school system could provide information about youthful entrants into the labor force, while data on other members of the primary and secondary labor markets (women, the middle-aged, minorities) may require direct surveys to obtain.

Secondary Data Sources

California Department of Human Resources Development

U.S. Department of Commerce, Census of Population

U.S. Department of Labor

References

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Harold Sheppard, et al, The Political Economy of Public Service Employment (Lexington, Mass.: Heath-Lexington Books, 1972).

Lester Thurow, Investment in Human Capital (Belmont, California: Wadsworth Press, 1970).

Rand Urban Policy Analysis Group, "Alternative Growth Strategies for San Jose: Initial Report of the Rand Urban Policy Analysis Project," (Santa Monica: Rand Corporation, 1971).

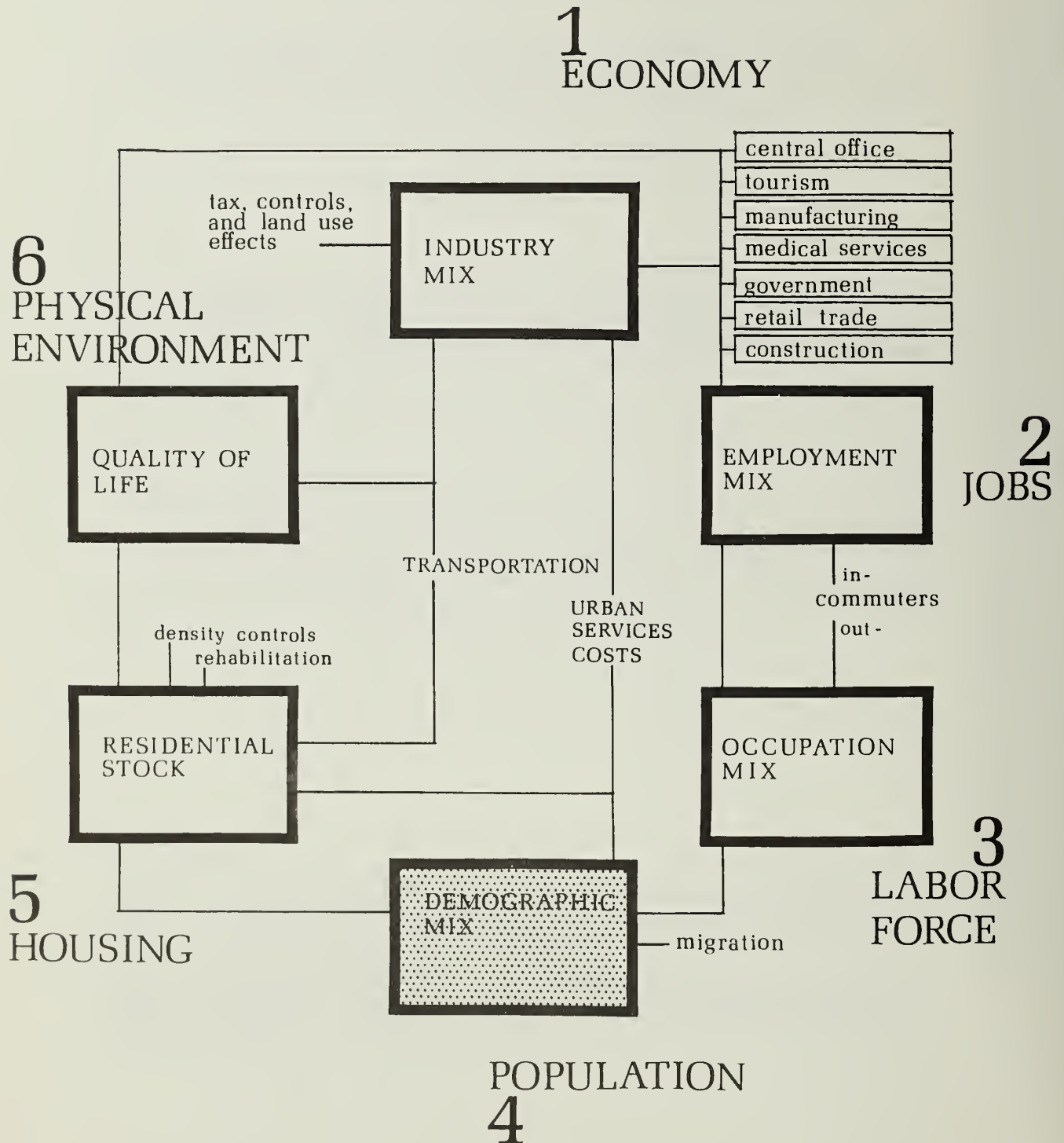
Costs

The data tabulation portion of the study could be done for \$10,000; the second part would cost about \$40,000, depending upon how much original data would be collected.

Recommendations

The small study is easy to do and provides basic information; it should be carried out as soon as possible after checking to be sure that it does not duplicate studies already done locally. The second study is low priority and can await the results of the first study and others before going ahead.

4. POPULATION



I. DEMOGRAPHIC TRENDS

Most of the speculation about what is happening to different population groups, types of families, and households is done in the absence of any real information to back it up. Since many of the data are quite handy, it should be unnecessary to speculate; movements of middle class families, ethnic minorities, hippie communes, families with children, poor people, old people, and so forth, can be observed and documented. Population information from the Census and local agencies is good, and can be supplemented where necessary by small surveys.

Major Issues

Is San Francisco becoming a city of the young and the old? Of the rich and the poor?

Is the middle class leaving the city?

Are families leaving the city?

Are San Francisco residents increasingly minorities and transients?

Research Questions

What significant differences exist in the San Francisco resident population of 1970 from that of 1960 and 1950?

What is the net change in population groups by race, income, age, marital status, family size, and household type?

What part of the 1970 San Francisco population lived in San Francisco in 1965? By income, race, age?

Policy Implications

Factual observations can be made about the changes in the absolute and relative sizes of various population groups. If these changes are seen as desirable or undesirable, then policies should reflect those judgments; if they are considered acceptable, then policy decisions may be unnecessary.

For policy formulation, this study relates closely to the next study on Motives for Intrametropolitan Migration. If, for instance, the middle class as defined by income is found to be leaving the city and a reversal of this trend is seen as desirable, then the next step is to find out what is causing the movement. The same applies to families, old people, or any other group. Once it is established why certain groups are leaving or arriving, policies can be formulated to deal with those causes.

In addition, if population shifts indicate particular problems for the city, policies could be formulated to solve those problems. For example, the problem of increased social services for particular groups could be relieved by increased federal participation in bearing their costs, once these costs have been identified.* Or, increase in unemployment among certain groups could indicate a need to direct efforts at attracting industries whose labor requirements match the occupational characteristics of those groups.

Study Design

This study can be done at two basic levels: one is a short report intended to supplement reports already published on population characteristics, and the other is a population accounting model.

(1) Short Report. The report should include significant changes in the San Francisco population from 1950-60, 1960-70, and 1950-70. It should be descriptive and include supporting statistical tables and useful graphics. An initial list of the items to be examined are:

- families as percentage of households
- families with children under 18 as percentage of families
- families with children under 6 as percentage of families
- percentage of change in each five-year age group
- percentage of total population in each census year in each of the most significantly changing age groups
- percentage of change in each income group
- percentage of total population in each census year in each race group

*For methodological reasons, the question of fiscal impacts of different population subgroups is addressed in the following study on motives for migration.

- ratio in each census year of married minus separated to total population
- percentage of each 1970 five-year age group with 1965 address outside San Francisco
- percentage of each 1970 income group with 1965 address outside San Francisco
- percentage of each 1970 race group with 1965 address outside San Francisco

Most of the above data can be found using printed material. A special tabulation may be necessary, however, for items involving the 1965 address. Since DCP already owns the census tapes, costs would involve software computer time and analysis. If computer tapes are used, any item can be related to any other item for census tracts, groups of tracts (neighborhoods), or the city as a whole.

Since the information in this report will be most useful if understood by non-statisticians, the graphic presentations should be as demonstrative as possible. Interpretation of the trends and patterns should accompany the data.

As in other types of studies, comprehensiveness can be in inverse relation to usefulness. This design attempts to avoid such a danger by selecting items of information that will yield highly informative results. The probability of uncovering, by the brute quantity of tables generated, a trend that would totally escape the experienced observer is extremely low. Therefore, the selection of the most probably useful questions should be directed by City officials concerned with population-related problems.

(2) Population Model. The matrix (or analytic component or cohort survival) model of population analysis is so easy to construct, easy to use, and generally worth having that keeping a resident computer version is clearly worth the small effort required. Essentially an accounting device, the technique keeps track of different age, sex, and other groups through time, given assumptions about birth and death rates, and migration. Birth and death rates are fairly consistent over the short run for specific age and income groups, and the implications of different patterns of migration can be traced out at small cost once the base data have been established. In addition, the effort is cumulative, so that any task once done is easily repeated and new effort can be concentrated on expanding the data base, the capacity of the model, and knowledge about the parameters (such as births and migration) of the process.

Secondary Data Sources

California Department of Public Health

San Francisco Unified School District - average daily attendance reports

U.S. Department of Commerce, U.S. Census: Detailed Population Characteristics, 1950, 1960, 1970

U.S. Department of Commerce, U.S. Census: Public Use Sample, 1970, 1960 (if and when available)

References

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S.P.U.R. Report, Part 1-B, Vol. 111, 1972.

Cost

Basic data tabulation, analysis, and reporting can be done for not more than \$10,000, and the start-up version of the population model could be prepared for \$5,000, given the data available in the tabulations.

Recommendations

We recommend that both portions of the Study Design be given high priority. Planning Department Staff has developed considerable expertise at the analysis and use of census data and has published reports on population. Careful thought should go into what additions to this information would really be useful for policy decisions, and studies should be handled on that basis. Our list of items in the study design is intended as a starting point for developing useful questions.

J. MOTIVES FOR INTRA-METROPOLITAN MIGRATION

The demographic study proposed above should supply a great deal of information about who (in terms of demographic types) is moving into and out of San Francisco, but policy makers can do little about the "who" unless they understand "why". There is a wealth of popular mythology about why certain population groups are moving out of the central city. These myths may or may not be based on fact. A clear picture of the motives of migrants would certainly be a helpful addition to a policy-maker's fund of information.

Major Issues

Do families leave the City because schools are better in the suburbs?

Do people flee the City because they feel safer from crime outside?

Do some residents pay an unfair share of the costs of running the City?

Is the City too expensive a place to live, for middle class taxpayers? Are housing costs too high?

Does the City attract poor people and hippies who live off welfare and create tax burdens for the rest?

Does the City make a profit, tax-versus-services-wise, on some population groups while losing on others? If so, which groups are which?

Research Questions

What reasons do intra-regional migrants give for their decisions to relocate?

What part do the quality and cost of city services play in those decisions?

How do motives for relocation vary by demographic characteristics?

What are the economic costs and benefits for residing in the city versus residing in the suburbs for households of different income, age, and size?

What is the relation of city services used to city services "bought" for households of different income, age, and size?

Policy Implications

If the causes of current migration patterns can be uncovered, and particularly if the impact of the city's service policies on migration can be pinpointed, then policies to affect change in these patterns can be formulated. Without a reasonably clear idea of the causes, any attempts to alter intra-regional migration patterns might not only fail but also intensify the pattern seen to be undesirable.

Study Design

The data gathering problem should be attacked from two directions, one subjective (behavioral) and the other objective (economic). The first approach answers the question, "What do migrants perceive to be the motives for their relocation decision?" The second answers the question, "If their residence location were decided solely on the basis of measurable rational criteria, how would they decide?"

(1) Survey Research (Subjective/Behavioral Motives).

a) Interviewees - possible sources for interviewees are records of realtors, waiting lists for new housing projects or subdivisions, moving company records, suburban welcome wagons, apartment managers, reverse directory calls to new developments, etc.

b) Instrument - the survey questionnaire should include economic, externality, amenity, and attitudinal (racism) motives. Both open ended questions and list ranking should be used along with demographic questions for stratification. Some simulation questions probing whether the individual believes he would have moved given alternative situations should also be used.

c) Interviewing technique - personal interview is recommended but telephone could be used for a minimal survey.

(2) Household Decision Analysis (Objective/Economic Interests). A set of "representative households" should be described for several census tracts chosen to represent different income and demographic characteristics. (For instance, a household might have four people including two school-age children, an income of \$13,000 per year, and a forty-five year old household head with a high school education). Service utilization should then be estimated for each representative household and given a dollar value based on its cost. Techniques for cost allocation can be found in the Benson and Lund, Mace, and Green references. The cost derived can then be compared to the household's local tax payments and will reveal whether the household gains or loses in its aggregate transaction with local government. Estimates should then be made regarding the tax bills and value of the same service use for selected suburbs.

These results can then be placed in a table of other economic considerations and compared with various suburbs. In addition, some estimation of the quality of educational services should be included, using a standardized measurement. Cost of housing could be estimated after talking to local realtors (perhaps posing as head of the representative household) and by discussing loan policies with local lending institutions. Rent levels can be found in the census data and from realtors. Transportation by auto can be figured on a per mile basis with number of miles derived using the Bland and California Business and Transportation Agency reports. Some knowledge of shopping area location would be necessary to estimate costs of using various transit systems.

Because job opportunities may vary between City and suburban locations, comparisons should also be made between households matched by the education, age, and race of household heads; such comparisons would treat the incomes of the household as a benefit of location to be included along with the other benefits and costs described earlier. The data for calculation of these job opportunity benefits could be obtained from the Census. Thus, no further stratification of the original sample would be required.

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Costs

Survey research costs in the neighborhood of \$60 per interview, if interviews are an hour in length. A good deal of information can be obtained in that time, the costs are not reduced much by shortening the time, and interviewees become restless if attempts are made to go longer. These considerations make it worthwhile to attempt to combine as many purposes as possible that fit in the same sample design, and to spend a good deal of effort refining and pretesting the survey instrument. The unit cost cited above includes the preliminary work, data coding and

tabulation, as well as the interviewing; analysis, interpretation, and report preparation are additional. A minimal survey of 100 households should thus cost about \$10,000, and a more extensive survey or a series of surveys including reinterviews would cost correspondingly more.

A study of the economic costs and benefits of household location decisions as described above is a complex research effort, even if only 15-20 representative types are considered. Costs for a minimal effort (three man-months) would be about \$5,000. A larger study considering all the factors mentioned in the design and a careful allocation of service utilization and tax payments could cost about \$25,000.

Recommendations

The priority of this study would depend on some value judgments about the results of the demographic study. If current trends are seen to be desirable, then this study would be more interesting than important. If, on the other hand, there is some desire for government intervention to alter current trends, then it is of considerable importance to find the causes of these trends. It would not be feasible to develop a picture of motives that could be demonstrated to be statistically representative of the migrant population. It would, however, be quite feasible to develop a picture that would have a level of accuracy sufficient for policy purposes. Given the expressed concern on the part of numerous City officials and civic leaders, at least a minimal survey appears to have a high priority.

K. SAN FRANCISCO AS AN IMMIGRANT RECEPTION STATION

Cities that serve as regional centers have historically also served as "reception stations" for the immigrant groups that provided the pool of cheap labor for young and growing cities. Each city, however, has its own story of development which has shaped the particular character of that central city.

Major Issues

What are the benefits and costs to the City of in-migration?

If San Francisco is providing a service to the nation or region by serving as a receiver and educator of immigrants, who should bear the costs of that service?

Research Questions

What was the initial economic role and the subsequent economic history of each large immigrant group (domestic or foreign) since 1800?

What is the pattern of dispersion of each group to areas within and outside San Francisco? Where do they come from? Is it still going on?

How has upward (downward) mobility of each group been achieved?

What is the ethnic composition of municipal departments today of various business sectors?

Policy Implications

The results of the study could lead to viewing the acculturation of immigrants as an important social function. It could also be a basis for a national policy of underwriting this function of central cities.

Study Design

This study would primarily be a descriptive historical and sociological study using as many primary sources as possible. If desired, the relationships between in-migration (measured by decades) and service costs could also be analyzed.

References

Peter Blau and Otis Dudley Duncan, The American Occupational Structure (New York: John Wiley, 1967).

Ronald Crowley, "An Empirical Investigation of Some Local Public Costs of In-migration to Cities," Journal of Human Resources (Summer, 1970).

Dale Hathaway and Brian Perkins, "Farm Labor Mobility, Migration and Income Distribution," American Journal of Agricultural Economics (May, 1968).

Charles Price, "The Study of Assimilation," in J.A. Jackson, ed., Migration: Sociological Studies II (Cambridge, England: Cambridge University Press, 1969), pp. 181-237.

Lyle Shannon and Magdaline Shannon, "The Assimilation of Migrants to Cities: Anthropological and Sociological Considerations," in Leo F. Schnore, ed., Social Science and the City: A Survey of Urban Research (New York: Praeger, 1967), pp. 49-76.

Costs

A minimal study could be done by DCP staff for a total cost of not more than \$5,000, whereas a serious effort by a recognized urban historian or sociologist could cost as much as \$30,000.

Recommendations

This is not a high priority study. It would serve mostly to provide additional perspective on current problems, although the subject is feasible for study and would be extremely interesting. Perhaps the most economical way to accomplish this study would be to offer a dissertation fellowship to a social science graduate student.

L. GROWTH CONTROLS IN NEIGHBORING COMMUNITIES

It can be argued that many of San Francisco's problems are forced upon the City because suburban communities systematically exclude the poor and the minorities, forcing them to bottle up in the City. San Francisco may be doing a perfectly

satisfactory job of assimilating immigrants and preparing them for urban life, but be unable to find communities in which to place its "graduates." To test this general hypothesis, we need to know that there are substantial numbers of the San Francisco population who are able and desire to live in the suburbs, that suburban communities successfully turn away potential residents with the same characteristics as those wishing to leave the City, and that policies of suburban communities (as opposed to individual preferences or market forces) have a significant impact on which potential residents are admitted.

Major Issues

Will San Francisco be trodden down if everyone else shuts out the downtrodden?

Does growth control actually work, or are secular trends much more powerful?

Research Questions

What growth control policies are being implemented in other Bay Area communities?

Are there members of the City's population who are discouraged from leaving the City by suburban growth controls?

Where growth controls have been applied, what impact has this had on growth, population composition, property value, rents, rehabilitation, etc.?

Policy Implications

The City's primary interest in the question is in knowing how hard it should lobby at the regional level (ABAG) and the state level to counter suburban growth policies. Groups already exists--e.g., the National Committee against Discrimination in Housing--with which the City could join. A secondary benefit would be in gaining some idea about what growth controls to apply to San Francisco, either to counter the effects of other communities or to achieve other objectives.

Study Design

Many communities have gone on record opposing growth, at least in some form; the most recent additions to that list include Aspen, Colorado; Alameda, California; Martha's Vineyard, Massachusetts; Marin County, California and Fort Lauderdale, Florida. Many are in the Bay Area. Experience in these communities may be relevant to the concerns of San Francisco, although there is probably little evaluation or documentary evidence that is available yet.

Methodology would need to be particularly eclectic. Key informant interviews (realtors, developers, city officials, mover and potential mover families), analysis of migration flows and population composition around the Bay Area, survey research, microeconomic analysis of the household location decision described in Study J above, and other kinds of analyses could be used to investigate the questions. Most of the results would probably be of a speculative or circumstantial nature, but might nonetheless suggest a reasonably clear pattern.

Secondary Data Sources

Association of Bay Area Governments

Contra Costa County Board of Realtors

Homebuilders Association of the Greater East Bay

U.S. Department of Commerce, Census of Population

References

Michael Agelasto, "No-Growth and the Poor: Equity Considerations in Controlled Growth Policies," Planning Comment, 9, 1-2 (Spring, 1973), pp. 2-11.

William Alonso, "Urban Zero Population Growth," Daedalus, Vol. 102, No. 4 (Fall, 1973), pp. 191-206.

Anthony Downs, Opening Up the Suburbs (New Haven: Yale University Press, 1973).

Urban Land Institute

Costs

A minimal study consisting of an informal survey and a report could be done well for \$5,000, and a more systematic study might cost \$20,000.

Recommendations

Unless more evidence emerges that this is a serious problem for San Francisco, there is probably no need to start such a study. The City should, however, keep in contact with local agencies that are concerned with regional growth and population distribution problems (mainly ABAG) and watch for signs that indicate that the City should enter the arena.

5. HOUSING

1
ECONOMY

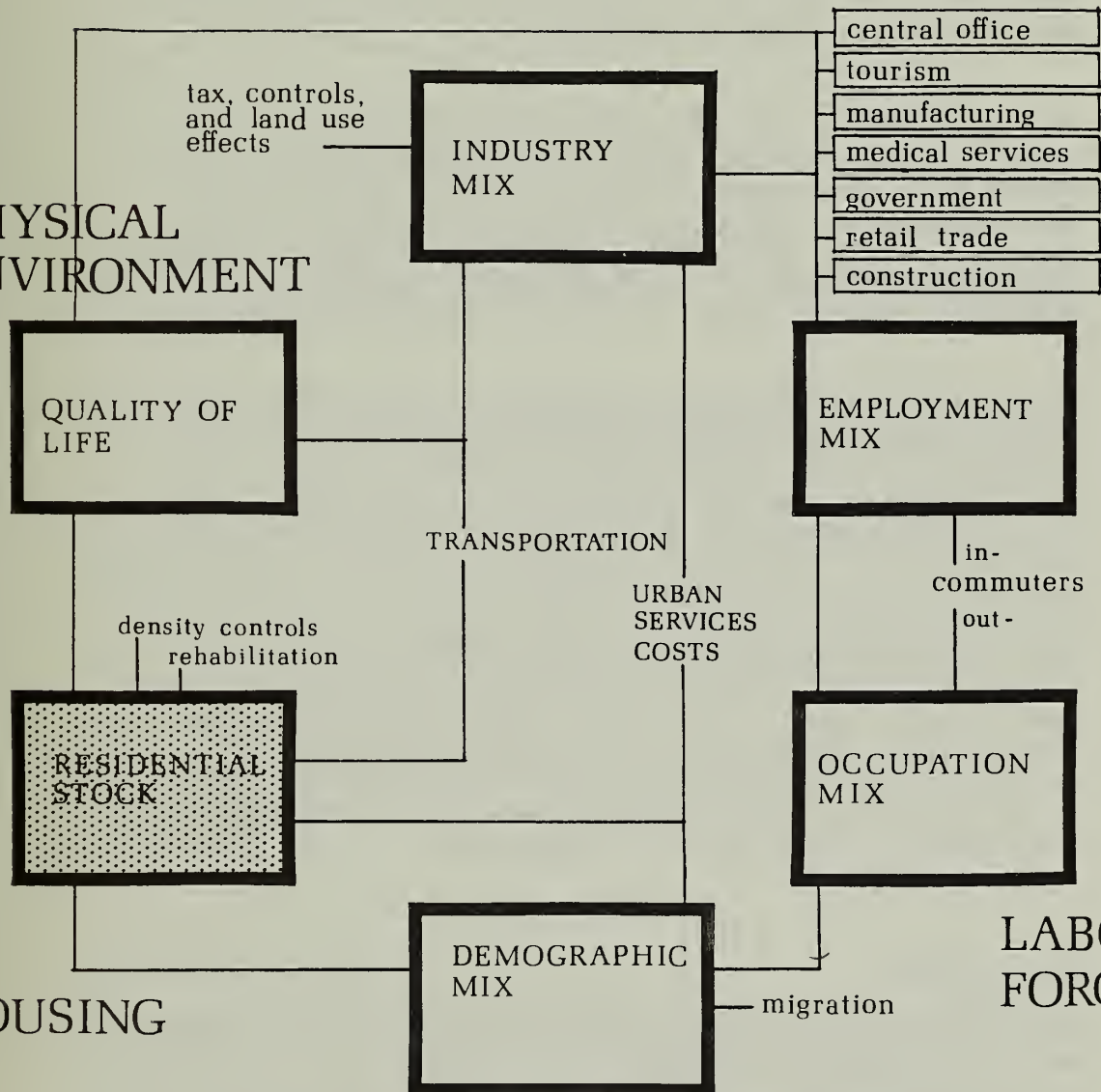
6
PHYSICAL
ENVIRONMENT

2
JOBS

3
LABOR
FORCE

5
HOUSING

POPULATION
4



M. THE HOUSING STOCK AND ITS RELATION TO POPULATION CHARACTERISTICS

This study focuses upon the relationship of the housing supply to population characteristics. There is undoubtedly an interaction between the two, although admittedly not much is known about the direction of causality. Does the existence of a fixed stock of housing ultimately determine the characteristics of the occupants? Or does the housing stock merely adapt itself to any and all demographic shifts? These are the kinds of questions that this study must address.

The San Francisco housing inventory can be thought of as a series of sub-markets, which are delineated along lines of family size, age, income, status and ethnic origin. Therefore demographic changes do not affect the city's housing stock uniformly. Rather these changes put selective pressures upon some submarkets. As a result some neighborhoods are affected more than others by specific demographic changes.

Also the city of San Francisco exists within a region-wide housing market and is therefore affected by external factors. If middle and upper income families cannot find housing which offers the range of services they desire within San Francisco, then there will be pressure for them to move outside the city. However, low income and/or minority families may be unable to move according to their preferences because of discrimination and poverty. In these cases the families will adapt their housing to their needs as best they can. Another situation pertinent to San Francisco concerns those people working and living in San Francisco who desire smaller rental units. This pressure is ultimately felt in the desirable older residential sections where there are likely to be market pressures for conversions and/or demolitions of single family houses for multi-family use.

Major Issues

What are the kinds of pressures on the housing stock brought about by demographic changes?

How do these demographic changes manifest themselves regarding changes in the housing stock?

How does a fixed housing stock tend to shape or influence the composition of the population?

Does the housing stock adapt readily to changes in population and family composition?

Is there enough middle income housing in the city?

Research Questions

On an historical basis, what has been the correlation of housing stock characteristics and certain key demographic characteristics, such as family size, race, income, etc.?

How does this compare with other communities in the Bay Area?

What are the detectable changes in the housing stock, both qualitative and quantitative, which may be too subtle for census enumeration, but which may be amenable to field study on a selective basis?

What has been the pattern of housing construction in the recent past (by housing type, number of units, location, price, rent level, location within the city and date of construction)?

How has the housing construction within the past ten years been correlated with the demographic changes during this period?

Does this analysis of recent construction and demographic change provide a clue as to whether or not housing stock changes lead or lag population change?

What are the implications of all of the above concerning the future demographic profile (income, race, family size, etc.) for San Francisco?

Policy Implications

The results of this study may suggest specific kinds of public intervention in the housing market to correct deficiencies. To the extent that housing is a determinant of population these controls may be used as a mechanism to affect demographic mix. Conversely, to the extent that housing is a consequence of demographic factors, then efforts can be made to anticipate future housing needs.

An interesting hypothesis underlying the empirical questions is that although households are becoming smaller, dwelling space per person may be increasing for certain income groups in selective neighborhoods. If this is true it may represent an unrecognized urban benefit which merits encouragement, protection and a broader distribution among income classes. Neighborhood downzoning and height limits may be shown to be related to this particular benefit. In any event, it is a question that deserves thorough analysis.

Study Design

The manifestations of the relationship of the housing stock to demographic change are likely to be too subtle to have been captured by the decennial censuses. The issues of interest and concern to the city relate to neighborhood quality, an elusive concept, and the 1970 Census was notably lacking in measures or indicators of housing quality. Therefore the study will have to rely on more than analyses of census data and building permits.

It will be necessary to study several neighborhoods in detail to determine (1) the changes in the population and (2) the changes in the housing stock: specifically, new housing construction if any, demolitions, housing condition and maintenance and housing space per person. Further information could be obtained by questioning a random stratified sample of residents in these neighborhoods (and perhaps others) about their reasons for living here and what their housing choices would be if they were under no economic constraints other than to stay in the Bay Area.

Although many of the data are already available at the aggregate level, the crucial variable of floor space per person is not easily available at any level. A substitute for square feet per person is number of rooms/person, which is available at least for census years. The question of space trends per dwelling unit and per person may be judged of sufficient interest to explore two other approaches:

- (1) Working with the plans attached to building permits and attempting, for a small sample, to estimate square footage changes. If the permit office records are too disorganized for this attempt, then some changes in record keeping or permit form design can at least be suggested.

(2) Selecting representative neighborhoods for intensive study of precisely this variable--square footage per person, and attempting to reconstruct a longitudinal picture over the last six to twelve years if possible. No claims for citywide trends need be made; the identification of localized trends would be useful alone.

Secondary Data Sources

Central Permit Bureau; Department of Public Works, City of San Francisco

Changes in the San Francisco Housing Inventory, San Francisco City Planning Department, annually since 1967

San Francisco Board of Realtors

Security Pacific Bank Monthly Report of Building Permit Activity for California Cities and Counties

Small Area Bulletin, Bureau of the Census, Department of Commerce, monthly

References

William Grigsby, Housing Markets and Public Policy (University of Pennsylvania Press, 1960).

Journal of Housing (National Association of Housing and Urban Renewal Officials).

Trends in Housing (National Committee Against Discrimination in Housing).

Costs

The census data tabulations called for by this study could certainly be done by current DCP staff over a period of three to six months, depending upon time available. Outside consultants would probably charge about \$12,000 for covering the whole city.

A field study of selected neighborhoods (neighborhoods consisting of several square blocks) could be done by city staff. The cost would range between \$3,000 and \$5,000 for each small neighborhood, not including the survey research. This would be for field investigation which would include much visual analysis, and would tend to supplement the historical statistics for census blocks. A study of six small neighborhoods would cost approximately \$18,000 to \$30,000. The survey research project would cost at least \$15,000. An attempt at residential floor space estimating in three neighborhoods would probably cost \$3,000-\$4,000 per neighborhood studied in staff time; consultants might charge \$8,000 per area study.

Recommendations

The basic elements of this study would appear to be high priority due to its relationship to neighborhood zoning and competing land uses. The City Planning Department has already proven its research capacity in housing stock analysis, and many of the data necessary have already been collected in annual housing inventory reports. Provided that staff time is available, no outside assistance need be sought.

The study relating population trends to housing trends would be worthwhile if an organized attempt is being made to alter demographic trends. In such a case, the part housing plays in that trend is an important variable. The survey research project would be interesting, but not of high priority.

N. HOUSING REHABILITATION AND CONSERVATION

There can be no doubt that a significant percentage of San Francisco's housing stock is deteriorated. If allowing it to remain so is not desirable, an alternative to demolition and higher density is to rehabilitate existing buildings. The first step in the direction of this alternative should be an examination of the amount of deteriorated stock, current rehabilitation efforts, and the economic feasibility of

rehabilitation.*

Major Issues

Does the housing stock adapt to new needs and tastes through rehabilitation?

Are there market or other impediments to maintaining the existing stock by rehabilitation and conservation?

Does rehabilitation price low income people out of their present housing?

Research Questions

What portion of the housing stock is deteriorated and where is the deteriorated portion located?

What rehabilitation is taking place or has recently taken place and in what parts of the City has it taken place?

What are the prevalent policies on credit, mortgage, and insurance for the neighborhoods where rehabilitation is more needed?

How has restrictive zoning affected rehabilitation rates?

What are some of the typical costs of rehabilitation?

* It should be noted that a general housing rehabilitation program is different from restoration of buildings of particular architectural or historical significance. The latter is included in this report under amenities, Study R.

Policy Implications

Rehabilitation is one area in which local government action can make a very significant impact. Not only can the city control land use by zoning and other restrictions, but the city might even want to get involved in the financial side of rehabilitation by loan guarantees or other similar policies. Phillips and Bryson, and DMJM suggest ways that rehabilitation could be financed without bad social side-effects such as increased rent for the poor. City government could also initiate a public relations campaign to celebrate and encourage rehabilitation. A policy decision might also be to lobby for increased funding of such HUD programs as 235(i) and (j). If evidence of "red-lining" is turned up, an ordinance could be suggested to prohibit that practice.

Study Design

A graphic presentation could be made to show the location of pockets of deteriorating and dilapidated housing using figures from the 1960 census of housing. An overlay should then be made showing rehabilitation using information from the F.A.C.E. program, the Central Permit Bureau at the Department of Public Works, Urban Renewal Agency, and other available data. A particular emphasis on current rehabilitation efforts in recently rezoned neighborhoods would provide a useful focus. A working definition of rehabilitation should be established to distinguish it from normal maintenance.

An exploration of credit and mortgage policies regarding loans for rehabilitation can be made by interviews with financial institutions. These interviews should be cross-checked by interviews with building owners.

An investigation of costs of rehabilitation should be attempted by interviewing contractors in the rehabilitation business--the Bonded Remodelers Council would be one source for their names--and materials suppliers. Some distinction should be made between the materials and labor cost, and the level of skill needed for various parts of the rehabilitation process should be indicated.

Policy recommendations could be made based on the information gathered in these investigations and a full report prepared and presented to the Planning Commission.

References

Daniel, Mann, Johnson, Mendenhall, Comprehensive General Plan-1990-for Alameda, California "Housing and Neighborhood Improvement Action Program," 1968 (the program was never implemented).

Kenneth Phillips and David Bryson, "Refinancing: A First Step Toward a Realistic Housing Program for the Poor," George Washington Law Review, Volume 39, No. 4 (May, 1971), pp. 835-69.

Michael Stegman, Housing Investment in the Inner City (Cambridge: MIT Press, 1972).

Costs

A small study could be done for \$5,000, and a fuller study for about \$25,000.

Recommendations

This study is one of moderately high priority on a small scale. The data are fairly easy to gather and analyze. Also, the connection between information and policy is simple. The creative challenge is in formulating a policy that will work.

O. RESIDENTIAL DENSITY CONTROLS

The "downzoning" and "height limit" issues have been raised by several neighborhood groups in the recent past and they are likely to be raised frequently in the future. In order to be able to deal with this phenomenon more intelligently, the Department of City Planning should have at its disposal some concrete facts on the effects of actions thus far. It would also be helpful to have yearly progress reports on rezoned neighborhoods and on the effects of other density controls.

Major Issues

Is "neighborhood character" always threatened by higher residential densities?

Are changes in residential zoning causing increases in spatial segregation of income groups?

What are the effects of zoning changes upon patterns of housing maintenance?

Research Questions

What is an accurate statistical picture of residential neighborhoods that have been rezoned to existing densities?

What are the best ways to monitor changes in these neighborhoods before, during, and after the rezoning process?

How have the changes in rezoned neighborhoods compared to those in similar neighborhoods not rezoned?

Can the effect of density controls on other neighborhoods be predicted?

Policy Implications

The results of this study could help the Department of City Planning decide under what conditions density controls should or should not be encouraged, a subject of growing concern to San Franciscans. In formulating City policy, this study could be profitably related to study J (Motives for Intra-Metropolitan Migration) and study L (Growth Controls in Neighboring Communities).

Study Design

(1) Three sets of neighborhoods should be selected for study: neighborhoods recently rezoned neighborhoods similar to the rezoned neighborhoods in physical and social characteristics and several other neighborhoods of varying physical and social characteristics. The land use, property value, rent levels, and population characteristics for the rezoned neighborhoods should be found for a period before and after rezoning and for

that same total period in the similar neighborhoods. Several "after" measurements should be taken at intervals of a year or so. In addition, density changes should be measured both in people per acre and dwelling units per acre. (A distinction needs to be made between density and crowding. We suggest that the former be used to designate conditions at the neighborhood or larger level and be expressed in dwelling units/acre or people/acre or square mile. Crowding should be used to designate conditions at the household level and should be expressed in people/dwelling unit or people/square feet of dwelling space. It should be noted that in particular cases an increase in density may be a way to decrease crowding.)

From this information, judgments should be made either descriptively or statistically (cross tabulations, analysis of variance) as to what effects in the rezoned neighborhoods are attributable specifically to the zoning. These judgments should then be used to predict the effect of similar actions in the other selected neighborhoods. Value judgments can then be made and the department then can take the initiative for rezoning, encourage citizens' groups to do so, or oppose it.

When the most significant variables are discovered, a system can be instituted for continuous or periodic monitoring of these variables. A similar process can be used for height limits or other density control methods.

(2) The theoretical framework should be developed along the lines of that used in Study D (Fiscal Impacts of Transportation), and field work should be supplemented with financial analysis of cash flows under alternative decisions about location and zoning. This will permit considerable narrowing of the range of possibilities open to the private market and help concentrate attention on sample neighborhoods where the considerations of interest (density controls) might make a difference.

References

John Calhoun, "Population Density and Social Pathology," Scientific American, 206 (February, 1962), pp. 139-146.

G.J. McCall, "Social Effects of Density and Crowding," in Impact of High Rise Buildings on the Urban System, study design submitted to the National Science Foundation by University of Illinois, Chicago, 1972.

R.C. Schmitt, "Density, Health and Social Disorganization," Journal of the American Institute of Planners, 32 (January,

1966).

Daniel Stokols, "A Social-Psychological Model of Human Crowding," Journal of American Institute of Planners (March, 1972).

Conrad Taeuber, et al., Density: Five Perspectives, a ULI Special Report (Washington, D.C.: Urban Land Institute, 1972).

Costs

A minimal study would cost \$10,000, while a full scale study would come to about \$60,000.

Recommendations

This study, of all in the report, is most implementable at the departmental level. It should, therefore, be among the highest in priority.

P. NEIGHBORHOOD IMPACTS OF TRANSPORTATION

The various forms of transportation have major direct and indirect impacts on the neighborhoods of the City, but relationships are subtle enough to make it very hard to relate cause and effect. Impacts perceived by residents may be very incomplete and at the same time highly exaggerated. Noise and fumes from traffic have an enormous effect on residential areas, but the importance of this effect is not well documented. Residents dislike having through automobile traffic in their own neighborhoods, but expect to get through other areas with ease, using their cars.

There is also a resistance to the upgrading of any form of transportation, public or private, for fear that it will cause additional growth. Improved transportation almost always has negative side effects. The exception would be a subway, which is a high capital cost system and requires a large volume of ridership to justify the costs; hence subways are associated with residential growth.

Major Issues

What are the direct effects of different forms of transportation on neighborhoods, in the form of stimulating economic activity or new residences, providing access to jobs and other locations, etc.?

What are the side effects of different transportation modes, and how can these effects be measured and evaluated?

Research Questions

What are the travel times between various points within and outside the City, by different modes, times of day, etc., and how much do these cost on an average cost or out-of-pocket basis?

What is known or can be predicted about demand for housing in different neighborhoods? To what extent can transportation redistribute that demand? What are the measurable side effects of transportation on residential property values?

Policy Implications

Local transportation is one of the aspects of the urban system that the City government has the most control over, and transportation is of pervasive importance. Many opportunities exist for channelling or filtering, encouraging or discouraging, the amount of transportation services consumed and the modes chosen. There is probably no sector of the urban system through which the City can exert more leverage.

Study Design

Several kinds of analyses can be presented for investigating transportation impacts on neighborhoods:

(1) Revealed Preference. Changes in the characteristics of the transportation system can be related to property values, rentals, and other expressions of individual market behavior to determine whether transportation attributes affect demand for residential amenities. Quiet versus heavily travelled streets, intermittent versus steady, different types of vehicles, alignments, buffers, etc., can be considered. Previous studies of this

type have had difficulty controlling for the many other variables that affect residential demand and price, but carefully structured experiments should be able to quantify some of the stronger relationships.

(2) Rational Comparisons. It is a fairly simple matter to determine which areas have the best access to which central locations, and which modes provide the best service. For example, trip times from the Richmond to downtown via Muni can be compared with times from Concord via BART, adjusted for quality differences, to determine whether transportation might be a reason for leaving the City. Certain kinds of trips are more difficult than others (relative to distance), and the advantages of one mode over another vary from place to place. In making comparisons, it can be asked what would have to be done to make the rankings switch, such as creating reserved bus lanes and lowering fares off-peak.

(3) Neighborhood Traffic Studies. Using the information generated in the first two types of studies, a neighborhood traffic study would seek to find ways of improving the quality of each neighborhood through transportation policies. Streets may be cut off--as in Berkeley--and diverted, or changed into parks, or partially planted; intersections can be signalized, controlled with two- or four-way stop signs, made one way, etc. DCP staff have done similar studies in the past, and would require little help to be able to do those of the type contemplated here.

Secondary Data Sources

City Assessor's Office, City of San Francisco

Department of Public Works, Traffic Engineering

Multiple Listing Service

San Francisco Municipal Railway

References

Douglass Lee, "Consequences of Service Reductions in Municipal Transit: San Francisco's Muni," Transportation, 2 (1973), pp. 195-218.

Douglass Lee, Impacts of BART on the Prices of Single Family Residences, Volume VI, Land Use and Investment Study, BART Impact Studies (Berkeley: Institute of Urban and Regional Development, June, 1973).

Costs

Minimal versions of the above studies could be finished for \$10,000 for the group, and a set of full-scale studies should cost \$50,000 for three to five neighborhoods.

Recommendations

The rational comparisons study is very simple and should be started very soon. Neighborhood studies are also high priority, while the more research-oriented questions in the first study are of moderate priority. Extensive studies are less urgent.

6. PHYSICAL ENVIRONMENT

1
ECONOMY

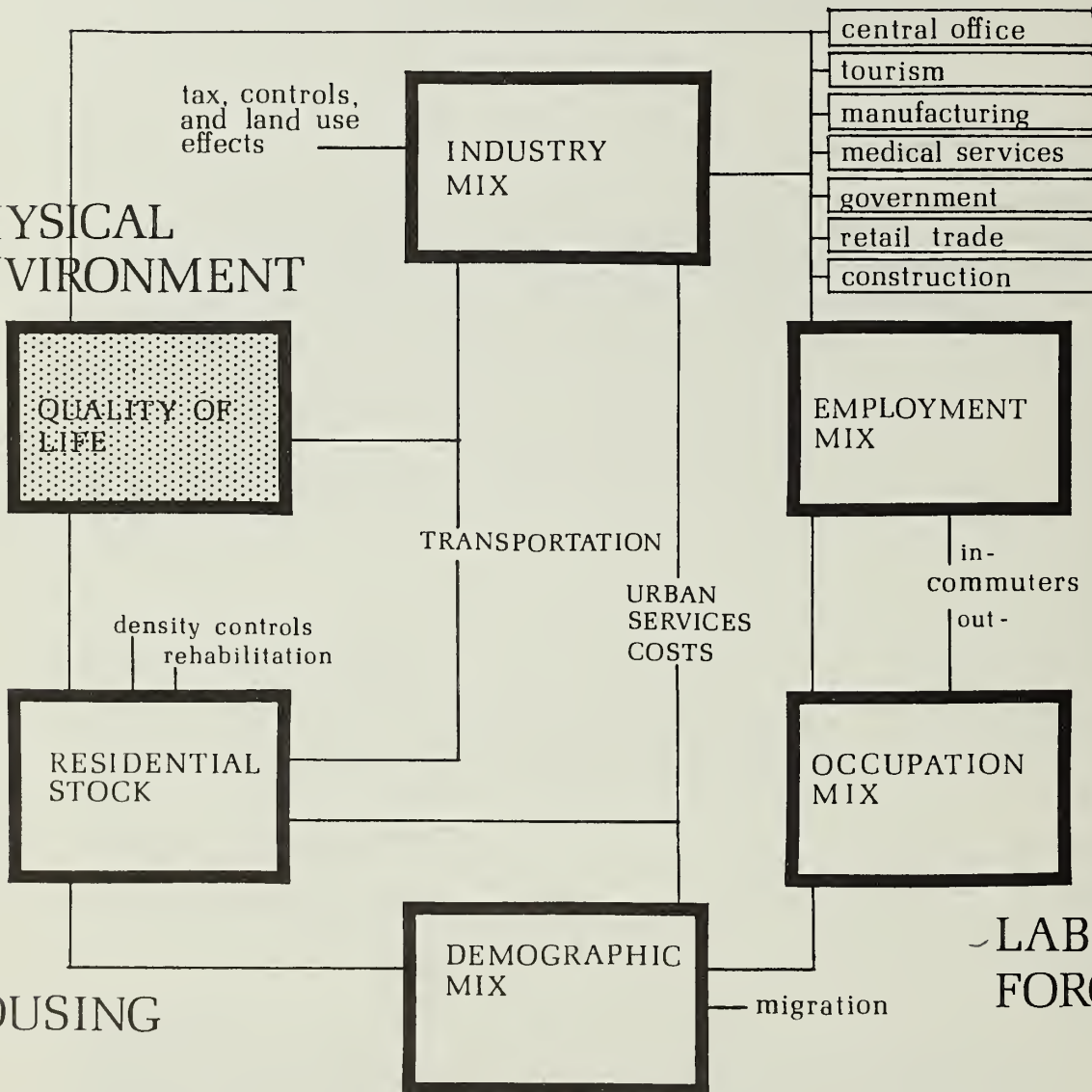
6
PHYSICAL
ENVIRONMENT

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JOBS

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LABOR
FORCE

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HOUSING

POPULATION
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Q. ENVIRONMENTAL IMPACTS

Almost everyone is concerned about the environment and would like to prevent any adverse impacts on it. Although some would claim that environmental goals must be sacrificed for other goals, the environmentalist view has a wide popular appeal and has been institutionalized in state and federal legislation. The aim of this study is to define the urban environmental problem in a way that leads to solutions, to gather and interpret the relevant data, and to propose feasible ways of attaining and/or preserving a healthful and pleasant urban environment.

Major Issues

Do more people automatically cause more pollution?

Do highrise buildings bring more or less pollution?

What are the costs of pollution?

Can resource consumption be reduced without hardship?

Is increased pollution an inevitable consequence of economic growth?

Are there technological solutions to some environmental problems?

Research Questions

What data on pollution have been collected for the Bay Area by Federal, State, and regional agencies? by city agencies? by other sources?

What is the rate of increase or decrease on a source-by-source basis of various types of pollution?

What types and quantities of pollution are related to what types of land use?

What are the micro-climate effects of large, tall, or concentrations of large buildings?

How does highrise compare to lowrise in pollution production and resource consumption?

What environmental factors are subject to control by city government?

Policy Implications

The aim of this study would be to develop a systematic and coordinated environmental policy for the city of San Francisco; included would be methods for solving existing environmental problems and for preventing future problems.

Study Design

For the total study we envision a five step process. (As preliminary studies, relevant parts could be extracted and pursued independently):

- (1) Literature Survey. A survey should be done of the best current literature on the urban environment and its problems. This literature is quite extensive and ranges from the very technical to the very popular. The aim of the survey should be primarily a clarification of the problems and an analysis of the applicable theory. All dimensions of the problem should be covered including the technological, health, political, and aesthetic aspects.
- (2) Data Collection. All relevant data on the San Francisco environment should be collected from existing Federal, state, regional, and city agencies. Additional data should be sought from other sources such as universities. Tabulations could be made of what data is available from which sources.
- (3) Interpretation and evaluation of data. The best available theory should be applied to the data to develop the clearest possible statement of San Francisco's environmental situation. This should include an evaluation of existing data and an indication of any possible improvements in collecting procedures. It should also point out any data that would be useful but are not available.
- (4) Regulatory techniques. Once the problem is clearly understood in its physical, economic, and other aspects, the study should develop and/or evaluate policies and techniques for regulating and compensating for the costs of adverse environmental impacts. One portion of this effort would be the development of methods for pricing adverse impacts, for costs cannot be properly allocated unless those costs are

determined. Another portion would be an analysis of various possible regulating procedures and of their economic and social impacts. These could include both use regulations and specifications as to technology.

(5) Recommendations for action. A final report should be made recommending environmental policies for various city departments and specific proposals for legislation. These should be presented to the Board of Supervisors and the Planning Commission for action.

References

Paul Barkley and David Seckler, Economic Growth and Environmental Decay: The Solution Becomes the Problem (New York: Harcourt Brace Jovanovich, Inc., 1972).

Bolt, Beranek and Newman, Inc. Noise Environment of Urban and Suburban Areas. Technical Studies Program of Federal Housing Administration and U.S. Department of Housing and Urban Development (Washington, D.C.: U.S. Government Printing Office, January, 1967).

Nicholas Coomber and Asit Bisway, Evaluation of Environmental Intangibles (Bronxville, New York: Genera Press, 1973).

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M.E. Delany, W.C. Copeland and R.C. Payne, Propagation of Traffic Noise in Typical Urban Situations, Report AC 54 (Teddington, Middlesex: National Physical Laboratory, Department of Trade and Industry, 1971).

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John McCarroll, et al., "A Comparative Analysis of the Relationship Between Mortality and Air Pollution and Weather," Part I and II, PB198 516 (Springfield, Virginia: National Technical Information Service, June, 1965).

Bertram Murray, "What the Ecologists Can Teach the Economists," New York Times Magazine (December 10, 1972).

National Bureau of Standards Economic Impact of Noise, National Technical Information Document 300.14 (Washington, D.C.: U.S. Environmental Protection Agency, December 31, 1971).

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F.M. Storrs, E.A. Pearson and R.E. Selleck, Final Report, A Comprehensive Study of San Francisco Bay, Volume IV, Water and Sediment Quality and Waste Discharge Relationships, SERL Report No. 67-4. (Berkeley, California: Sanitary Engineering Research Laboratory, University of California, August, 1969).

Charles Vars, et al., Study of the Social and Economic Effects of Changes in Air Quality (Springfield, Virginia: National Technical Information Service, June, 1971).

Costs

Different aspects of the general problem could be broken out and addressed one at a time, for roughly \$5 or \$10 thousand apiece; a full scale study would well spend \$200 thousand.

Recommendations

Much of the necessary work is already under way, in connection with the SPUR study or by various engineering and environmental protection agencies. Many results can be easily transferred from other locations, which places much of the topic under the heading of basic research rather than policy analysis specific to San Francisco. The City should identify the gaps in the existing efforts and seek to fill them in, but the major responsibility need not be housed in the City Planning Department.

R. AMENITIES, AESTHETICS, AND THE QUALITY OF LIFE

San Francisco is unusual among central cities in that many people actively like and enjoy the City, either as residents or as tourists; hence, there is concern that growth may destroy the things in the City that are the most desirable. Insecurity about what may be destroyed is heightened by not knowing exactly what are the special qualities that make San Francisco a pleasurable place to be.

Major Issues

Will additional highrise construction lead to the "Manhattanization" of San Francisco?

Is the City gradually losing its physical charm and becoming a place without any "there" there?

Do population shifts and growth threaten the quality of life in the neighborhoods and withdraw the necessary support for San Francisco's restaurants and other historic amenities?

Research Questions

What amenities unique to San Francisco are impacted by growth or by highrise buildings?

What particular qualities about the City are enjoyed by residents, workers, tourists, and others?

Can the good qualities be maintained and enhanced by redevelopment, or do they depend upon rehabilitation and conservation of physical attributes?

Do historic buildings, ethnic cuisine, street life, quaint houses, etc., need subsidies, or protective regulation, or no interference to be economically successful?

Policy Implications

If those qualities that make San Francisco a desirable place can be identified and observed, then attention could be directed at preserving or creating those qualities. The

City has numerous outstanding examples of adaptive uses of old buildings (Ghirardelli Square, Jackson Square) which seem to have become economically viable and even major tourist and shopping attractions. Activities of this kind could be further encouraged by understanding the market forces involved, studying the feasibility of various types of adaptive uses, and providing the appropriate regulatory constraints and economic incentives.

Although the focus of the study is somewhat vague, it is imperative that the "soft" side be represented in the decision process by as much hard information as possible; this need is created by the tendency of the private market to undervalue these considerations.

Study Design

Although a great deal of effort has been spent on promoting the aesthetic qualities that can be found in San Francisco, there is not much behavioral understanding of how people relate to these qualities and value them, and inadequate inventories exist of the important physical qualities. Two kinds of data gathering should be undertaken in order to address the questions:

(1) Attitudes and opinions held by individuals can be surveyed with some success. This could range in style from systematic survey research using a structured sampling design, to informal key informant interviews (architects, recognized urban aesthetes, noted long term residents of the City, etc., might be regarded as having sufficient unique insight to be worth interviewing as key informants). Care would need to be taken in designing a survey instrument that would permit abstracting from the specific context (e.g., liking a place because of personal associations or good friends rather than qualities of the place).

(2) Known resource amenities can be surveyed using inventory techniques. The Junior League has already done an historic building survey and published the results; this kind of effort could be carried out in more depth, and greater promotional effort devoted to it in order to make citizens more aware of the historical traditions observable in all neighborhoods of the City.

References

Donald Appleyard, et al., Street Livability Survey (San Francisco Department of City Planning, San Francisco, 1970).

Foundation for San Francisco's Architectural Heritage

Stephen Jacobs and Barclay Jones, City Design Through Conservation (Berkeley: University of California, 1960, mimeo).

Junior League of San Francisco, San Francisco's Architectural Heritage (San Francisco: Chronicle Books, 1968).

National Trust for Historic Preservation

Costs

A minimal study using a mixed survey approach could be undertaken for \$10,000, and a full set of surveys and inventories would cost at least \$100,000.

Recommendations

While neighborhood groups and individuals will undoubtedly continue to express strong opposition to projects that even appear to jeopardize valued amenities, it should be an objective of the public sector to see that the real social values get represented in both the public and the private decision processes along with the more readily priced factors. While putting a price on view or historic buildings may seem coarse and crude, there are methods for making some good guesses and these are not intended to replace more subjective valuations. Studies in the general area of quality of life can be undertaken one piece at a time, and should be started on a continuing basis.

S. LAND USE DISTRIBUTION

One of the interesting questions relating to current growth of the San Francisco downtown is whether it is actually competing for land with housing uses. This is certainly the case in several

local foci of controversy, such as the U.C. Medical Center and Yerba Buena. But what have been the overall or net land use effects of the highrise boom of the last ten years?

Major Issues

Is the central business district expanding into residential areas?

Does this encroachment of the downtown or adjacent areas account for the decrease in resident population experienced by San Francisco?

Research Questions

What does the current account of land use in San Francisco show?

What changes in residential land use are evident?

What quantity of residential land has been taken over by commercial or industrial uses?

What quantity of commercial or industrial land has been assigned to residential uses?

Policy Implications

A clear trend of displacement of residential uses by commercial and/or industrial uses has been cited by critics of San Francisco's economic growth. The existence and size of this displacement needs documentation as one piece in the current debate; the DCP may wish to restrict or encourage particular changes in land use if land use interfaces are creating undesirable effects.

Study Design

Methodology in land use studies is well-established and obviously familiar to the city's Planning Department. The important pitfall to watch for is changing definitions of land use, and perhaps changing accounting methods. If data for five and ten years ago can be made roughly comparable to the recently

published San Francisco Land Use Tabulations for 1970, then describing major shifts in total land use should be no problem.

This study could be completed very rapidly if focused on a few controversial areas of the city (Increased detail can be introduced by using Polk Directories and reverse telephone directories for such areas.). In any case, existing staff have proven capabilities in this research area; additional staff or outside consultants would only be necessary if time constraints of current staff prevented them from doing this study.

A subsidiary study of related interest would be one that examines changes in residential density over time. If past land use data were disaggregated by census tract as are the present data, such a study would be possible. Changing census tract definitions may make this study much more feasible at a level of aggregation of several tracts.

Secondary Data Sources

The Polk Directory

Reverse telephone directories

San Francisco Department of City Planning, San Francisco Land Use Tabulations for 1970

Costs

Minimal costs for this approach using three "neighborhoods" would be perhaps three person-months or \$5,000. Comprehensive comparisons for categories covering the whole city might not take much longer, depending upon the state of older data; \$20,000 should be adequate for this task.

Recommendations

This study would be a useful companion to the 1970 San Francisco Land Use Tabulations. Perhaps these questions have already

been answered in various planning studies; in any case, the data appear to be readily available. Since land uses change less rapidly than densities, trends in this area are presumably less volatile. The study is of medium priority.

T. NATURAL HAZARDS

Economic growth, if housed in highrise buildings, could present very real problems of survival in time of catastrophe. What is likely to happen in San Francisco may be a matter of debate among experts, but what did happen here and elsewhere during major natural catastrophes is a matter of research and record. The lessons of such experiences deserve far more attention and action if we wish to prevent new growth from inviting even greater disasters.

Major Issues

Would a major earthquake be a catastrophe for San Francisco?

Are modern highrise buildings really fireproof?

Do current building codes protect users adequately from natural hazards?

Research Questions

What has been the experience with highrise construction in other large cities hit by recent earthquakes: Anchorage (1964), Santa Rosa (1969), Los Angeles (1970), Caracas, Venezuela (1969), Japan, etc.?

What are the special fire hazards of highrise construction, based on experience here and elsewhere?

What building and fire regulations would be most effective in meeting the hazards identified above from both earthquake and fire?

What is the potential cost to San Francisco of not adopting each of several specific regulations?

Policy Implications

The implications of this study are far-reaching: certain older buildings or new building-types could be found totally unsafe for the San Francisco geological setting; recommended fire safety regulations and standards could change the design, furnishings, and costs of high-rise construction. Whether action is taken on the basis of such a study as this one, however, will be largely determined by political factors beyond the control of the DCP.

Study Design

The literature on the effects of earthquakes is a growing one. This study should have a historical-statistical part which reviews recent written material from the point of view of what has happened to highrise buildings in actual major earthquakes. A second aspect of the literature survey would concern fires in so-called "fireproof" highrises; some of these buildings raise very basic safety questions, given the totally enclosed environments typical of such tall buildings.

Besides compiling recent case histories, some engineering analysis should be done to determine earthquake and fire safety standards and the extent to which current buildings meet them. Estimates can also be made regarding the extent to which future growth would affect catastrophe prevention and catastrophe survival.

As input to the debate which is sure to follow any recommended changes, the costs of specific design requirements can be compared to approximate calculations of potential losses which would accompany fire or earthquake damage.

References

Michael Cassen, "Holocausts Above the Thirty-fifth Floor," The Ultimate Highrise (San Francisco: Bay Guardian Books, 1971), pp. 148-155.

Peter Owens, "What Happens When the Earthquake Hits," The Ultimate Highrise (San Francisco: Bay Guardian Books, 1971), pp. 138-148.

Karl Steinbrugge, Earthquake Hazards in the San Francisco Bay Area (University of California at Irvine: Institute of Governmental Studies).

Costs

A literature survey and synthesis combined with limited expert analysis of an engineering nature could be accomplished for \$10,000, but full scale analysis would require at least \$150 thousand. Much of this latter effort would be basic research, and probably inappropriate for the City to undertake.

Recommendations

Existing seismic studies underway in the Bay Area may cover all or much of the topics suggested for this study; further study need not be considered until preliminary analysis demonstrates that there are important gaps in the current and contemplated study of natural hazards in the Bay Area.

APPENDIX: DESIGN FOR A PLANNING INFORMATION MONITORING SYSTEM



EVALUATION OF ECONOMIC DATA SOURCES

The collection of study designs dealing with the San Francisco economy contains a number of secondary data sources. These form the basis of an information system relating to economic growth. This appendix describes and evaluates these sources and indicates which of them the DCP should acquire. It also describes sources which are often suggested as useful but which we find not generally applicable to studies of the San Francisco economy.

The Department has an interest in economic data at two levels: the city and the neighborhood. Most of the sources listed here involve citywide data. Since secondary data on less than the SMSA level are difficult to locate and tabulate for comparable neighborhood areas, such data often have to be generated from scratch.

Some of the study designs described in this report call for a selection of prototypical neighborhoods or statistically representative "families" or census tracts. Obviously, this somewhat informal stratified sample approach could be set up in such a way that the same neighborhoods or tracts are studied repeatedly from several different points of view. Thus, the data analysis requirements could be reduced to manageable size. Also there exists the possibility of following several sample areas through time (say 5 or 10 years) and building up a much deeper understanding of the dynamic processes at this micro level. Since this is the level where both the Department of City Planning and the City itself have the most influence (in contrast to the regional or the national economy), it would appear to be at least as useful as large scale data collection and analysis, where the control variables are not easily influenced by the Planning Department.

On the other hand, looking at the economy of the whole city of course requires the use of city-wide data. The following sources are evaluated according to their suitability for use in studying the whole urban economy of San Francisco.

A. Available and Suitable

(1) U.S. Department of Commerce, bureau of Census, Census of Business, 1967, Volume II, part 1; Volume IV; Volume V, part 1. Contains statistics for retail trade for counties and cities by kind of establishment, including employment, payroll, and number of establishments; statistics for whole-sale trade by county; and statistics for selected services for counties by type of service. Can be compared with 1963 edition. 1972 edition is due out shortly. (DCP should copy relevant pages).

(2) U.S. Department of Commerce, Bureau of Census, Census of Manufactures, 1967, Volume III, part 1. Provides establishments, unemployment, value added for counties; by industry for SMSA; by industry for county. Can be compared with 1963 edition. 1972 edition due out shortly. (DCP should copy relevant pages).

(3) U.S. Department of Commerce, Bureau of Census, Census of Population. Not very good indicator of economic activity, but the best source for demographic activity. DCP already owns adequate Census material, but some added processing capability would be helpful.

(4) U.S. Department of Commerce, Bureau of Census, County Business Patterns (annual). Gives employment, payrolls, and size of reporting unit by industry group for each county. (DCP should acquire this source).

(5) U.S. Department of Commerce, Bureau of Census, Small Area Data Notes. Departmental announcements from the Bureau of Census. Useful for anyone frequently using Census data. (DCP should subscribe).

(6) U.S. Department of Commerce, Bureau of Census, U.S. Foreign Trade: Waterborne Exports and General Imports (monthly). Provides shipping weight and value of cargo for dry cargo and tanker service for each port of lading. (DCP should acquire this source).

(7) U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings for States and Areas 1939-1970. Provides annual employment and payrolls for SMSA's by industry group by year. (DCP should acquire this source).

(8) California Board of Equalization, Annual Report. Gives retail sales taxes, property taxes, and assessed valuations by county. Retail sales taxes can yield taxable retail sales. (DCP should subscribe).

(9) California Department of Human Resources Development, California Community Labor Market Survey. Provides employment by industry for cities and prevailing wage rates. Published 1967-68 and 1969-70. (DCP should acquire this publication).

(10) California Department of Human Resources Development, Area Manpower Review: San Francisco/Oakland Annual Outlook and Planning Report, 1973. Contains SMSA data and estimated employment 1958-72 for San Francisco by industry. (DCP should acquire this).

(11) San Francisco Department of City Planning, Land Use Tabulations for 1970. Contains many items of data for each assessors lot and block and can be summarized by census tract and neighborhood. Includes land uses by SIC code and by facility type.

(12) Security Pacific National Bank, Economic Research Division San Francisco Bay Area Report: A Study of Growth and Economic Stature of the Nine Bay Area Counties, April 1971. Contains a large analysis section and many economically relevant statistical tables. A handy quick reference. (DCP should acquire.)

(13) Security Pacific National Bank, Research Division Building Permit Activity in the Cities and Counties of California (monthly). Provides number and valuation of building permits for new single dwellings, new multiple dwellings, residential alterations, new commercial, industrial, and other non-residential in each county and for main cities within each county. (DCP should subscribe).

(14) Wells Fargo Bank, Finance in California, 1972. Contains statistical data on the finance industry in California with some regional breakdowns. Available free by request.

B. Available but not generally suitable

(1) U.S. Department of Commerce, Bureau of Census. Annual Survey of Manufacturers. Only one relevant row of data in the entire volume, that for San Francisco. Data can be gathered from a library if needed.

(2) U.S. Department of Commerce, Bureau of Census, Census of Transportation. Smallest relevant reporting unit is the San Francisco production area which includes three SMSA's.

(3) U.S. Department of Commerce, Bureau of Census, Census of Construction, 1967. Data available only at the state level.

(4) U.S. Department of Commerce, Bureau of Census, U.S. Foreign Trade: Airborne Exports and General Imports, monthly. Provides value and shipping weight only by customs district.

(5) U.S. Department of Commerce, Domestic and International Business Administration. Construction Review, monthly. Provides valuation of residential and non-residential construction and number of residential units for the U.S., states, and areas. Also quarterly wage scale levels.

(6) U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, monthly. Provides monthly employment and payroll data for U.S., states, and selected areas by industry.

(7) California Department of Human Resources Development. Summary of Employment and Unemployment: San Francisco-Oakland Metropolitan Area, 1966-1972. Contains employment by industry for SMSA from 1966-1972.

(8) California Department of Human Resources Development. San Francisco-Oakland Labor Market Bulletin. Contains monthly data on SMSA employment by industry group.

C. Suitable information that is not available

(1) A great deal of useful economic data is unavailable because it is only tabulated at the SMSA level or higher. If the Bureau of the Census, the Bureau of Labor Statistics, and the State Division of Employment could be convinced to tabulate for major cities, the amount of available data would be significantly increased. Sampling densities, however, probably limit the geographic detail that can be extracted.

(2) Information on workers by place of employment has been notoriously unavailable from the U.S. census sources. Tabulation relating place of residence and other characteristics to place of work would be extremely useful (see Study Designs A-7 and F, pp. 56 and 74 of this report).

(3) Primary economic data on the "tourist industry" in San Francisco, separated out from other economic activities, would be helpful (see Study A-2).

- (4) Micro-economic studies of neighborhood retailing in several different sections of the City would be interesting.
- (5) Estimators of the employment multipliers for economic activities in the service sector are needed. For example of a use for this data, see Study A-6 (Government), p. 53.
- (6) Information on occupational characteristics cross-tabulated with commuting characteristics would be useful in studies such as F (Relation of Industry to Employment).
- (7) Special surveys of particular groups of potential workers (women, minorities, youth) to predict size of future labor force, as suggested in Study H, p. 84.
- (8) Survey research results on motivations of out-migrants from San Francisco to the rest of the Bay Area (see Study J, p. 92).
- (9) Tabulations of travel times for typical commute trips, within and into San Francisco (see Study P, p. 114).
- (10) The last section of this appendix contains a brief proposal for improved information on the physical state of the City, combining three existing data files. This would include some economically relevant data.

GENERAL PRINCIPLES OF INFORMATION SYSTEM DESIGN

The Design Process

Overview. The temptation to follow the mirage of all-inclusive comprehensiveness is very strong in the field of information systems. Popular opinion often implies that planners and politicians should attempt to have all the relevant data; consultants and their proposals frequently promise to provide a vast variety of indicators to handle any conceivable management or evaluation objective. But this claim to comprehensiveness is dysfunctional; fortunately even very conservative estimates of costs usually place these systems out of reach of all but a few heavily subsidized local jurisdictions. A moment's reflection is sufficient to realize that measurements are always tailored to very specific purposes, and only insofar as these purposes are shared across local jurisdictions can any

standardized systems of measurements be useful. Obviously, with the plurality of conflicting and changing purposes which is so typical of most municipalities, generalized information systems are inevitably costly failures.

The only defensible approach in such a decision environment is a strongly purposeful one. Based upon a limited selection of specific information needs, such a system would emphasize efficient search procedures rather than massive acquisition of static files. It would stress the need for rich descriptions of readily available sources rather than mechanical summaries of everything available. This approach would seek to implement constant up-dating and cross-referencing of its files, along with thorough indexing of a few sources, rather than passive collection and storage of whatever was offered. Finally, it would recognize the purposeful nature of all active information systems and thus deal more openly with problems of bias and conflicting sources, the need for public disclosure of governmental information, and the rights associated with the protection of individuals from governmental invasion of privacy.

Filing System for Existing Data. How might such a system be initiated for the San Francisco Department of City Planning? First of all, it is clear that no urban information system needs to be designed from scratch. The Planning Department itself already has an active information system in daily use, even if some of the formal trappings may seem to be missing. So does the Mayor's Office, various other key city departments (Public Works, Police, Fire, MUNI, etc.) and county offices, and numerous large private organizations (such as banks, real estate companies, League of Women Voters, etc.) Thus the first operational step in improving the existing DCP information system is to decide upon a temporary filing system for its existing data and a search or interview routine for use in exploring the systems of other organizations.

The filing system should be temporary because it will need revision as the system grows and exchanges new purposes for old. Whole categories of material may be retired from active use; other categories may be subdivided or dispersed. The filing system consists of at least two distinguishable physical (and conceptual) parts: the orderly arrangement of physical records and an active index or guide to the location of these records. The data themselves may be in the form of books or print-out, cards, or tapes, pamphlets and clippings; these

can be stored on shelves, in cabinets and folders, even in basements and labelled boxes. The vital concepts are easy access to primary materials and careful labelling. An index for these materials is already one step removed from the data, representing some conceptual organization of the raw data (key words, alphabetization, serialization, or simple lists of contents). It should be able to be very easily revised and up-dated; this means it should be subdivided into several parts and physically flexible. Something like a library card file is a good prototype, embodying several indexing principles in several cross-tabulated files.

Purposeful Selectivity. Already at this level purposeful selectivity begins to operate, to make the job of indexing and cross-referencing a manageable one. The index need not cover every single item on hand; it can and should focus on the contents of items most often used, as well as items judged to be relevant to current specific problems. To increase flexibility the cross-referencing system can also be separated from the index system.

Search Procedures--Interviews. Of course the filing system will change as new data are incorporated. But how should new data be sought out and selected? Initially, the search routine could be a series of structured interviews with information users in other organizations. This process can be highly refined as it progresses: not only is each interviewee asked to identify sources which his organization may control, but also he is asked to evaluate outside sources with which he is familiar and to recommend additional contact persons. Very quickly a chain of information personnel can be traced out which could function as a city-wide information system in many crucial decision areas.

In terms of content rather than contact, the interview schedule should seek to establish the format of available data, how often it is compiled, commonly recognized biases, its geographic or social class coverage, whether it is exhaustive, a summary, or a sample, and how readily it is available (cost, confidentiality, and physical form of the data records). Once again, such exhaustive information can only be sought for selected items; no manager has time to answer all these questions about all the data he uses. This raises the question of how this selection should be made.

A combination of predetermined priorities (such as those arising out of the study designs described in this report, for example) plus an eye for the innovative or unusual data source is the ideal approach. There is no need to describe data sources for which no use has been formulated in terms of existing problems, unless that data source is so surprising or striking that it suggests significant new uses by itself. Certain types of tax information could easily fall into this latter category, if public disclosure of corporate reporting were ever available at the local level.

Questions and Hypotheses. A useful device in maintaining a sense of focused rather than exhaustive search is to translate purposes or priorities into specific questions. The exercise itself often clarifies the limits of inquiry; and questions have the advantage of soliciting more questions in response. A somewhat more abstract approach is to group information needs around explicit hypotheses or problem statements. In using any of these devices, encounter with real data will force revisions and refinements of initial statements or questions.

Lists of Data Sources. The results of both the in-house inventory of data and the city-wide search for recommended sources would be fairly long lists of data sources, each source being partially characterized in terms of a variety of descriptors. Some possible descriptors are: name and address of source organization, relevant contact persons, major subject, tital of data, geographic scope, time frame, periodicity, main variables covered, and physical form of available data (publication, print out, cards, tape, file folders, etc.).

Although these lists should be kept relatively current over the years, only a few items need ever be actually acquired by the Planning Department itself. This simplifies physical and budgetary problems associated with the storage and retrieval of masses of data from many sources. Instead the DCP information system would act like a well-informed research librarian, telling you where to find relevant data but not actually keeping the "book" for you at its desk. This makes the frequent up-dating of these lists important, as well as cross-referencing activities.

Acquisition Criteria. Some data sources will be found to be of such frequent usefulness that acquisition becomes more efficient than referral. Naturally, the information system acts as a repository for DCP-generated primary data and secondary summaries of data as they are produced. U.S. Census materials are clearly essential to a wide variety of planning research activities, so their continued acquisition is an important part of the information systems task. The selection of and subscription to specialized periodic summaries of data besides the census should be guided by current specific research priorities.

Most acquisitions will be in printed form--books, periodicals, special reports, or computer printouts. Certain kinds of highly disaggregated or specialized materials may be available only on computer tape, however. Also, statistical manipulations of large amounts of information is sometimes only feasible with computer assistance. This raises the question of whether to "computerize" certain existing data files and whether to acquire computer equipment for use by the Department of City Planning rather than continuing to contract out for these highly specialized services.

Pitfalls of Computerization. It is important to realize some of the operational and fiscal pitfalls surrounding the use of computers. First and foremost, computer equipment never operates itself; programming even very simple operations using very clear languages still requires special skills and experienced personnel. But computers are not needed for simple operations; consequently the programming requirements of real research problems are usually complex and time-consuming. Also, training and personnel costs associated with in-house computer capabilities tend to escalate as the capacity of the equipment is extended. From a fiscal point of view, computerization often resembles drug addiction--larger and larger operating costs are incurred as the system becomes increasingly dependent upon an ever-changing complex technology.

A second pitfall is that computerized storage of certain types of data actually reduces their usefulness. Most computerized systems are rather inefficient storers and retrievers of non-numerical material; also pattern recognition is sometimes easier if data are available for visual inspection and manual manipulation.

Trial and Error Approach. Once the real limitations of computerization are recognized, the pros and cons of acquiring computer capability can be better assessed. Again, a trial and error approach can minimize initial costs and risks. Small computer units are available for rental or purchase; a trial rental would cost very little. One should not be misled by complaints that such systems are too small to be useful; if there are no real data manipulation problems to be solved on the smaller systems, then it is questionable whether a larger system is needed at all. An initial rental or investment should only be expanded because of actual overuse, not because of speculation about what could be done if it were twice as big. An even simpler test of the need for computer capability is to keep track of actual annual expenditures for out-of-house computer costs. If these add up to less than rental plus personnel for the contemplated in-house equipment, then such equipment is not yet needed.

Summary. In summary then, all information system designs should recognize the prior existence of informal information systems and the basic task of selecting data to serve specific research purposes, not to cover all possibilities. Thus, although the system may have long lists of available data, only a few of these will be acquired and catalogued at any one time. And of those items selected for acquisition, very few indeed will actually require computerization. Finally, since computer services are readily available on a rental basis, the decision to develop in-house computer equipment can be tested against actual tabulations of the costs of current staff utilization of such services out-of-house.

Two important process-related characteristics of information systems remain to be discussed: publicity of available data and evolutionary improvement of active systems.

Publicity. Highly organized and easily accessible files are of no use, obviously, if their existence is unknown. Since the system we are suggesting begins with specific purposes, the users of the data are presumably awaiting the results of various search procedures. But the information system personnel should also actively publicize their acquisitions to all planning staff. Regular orientation sessions should be held to acquaint staff with lists of sources, indexes, and recent acquisitions and to pick up new requests for data. Something similar to open stacks and a reading room in a library should be developed to encourage browsing in the primary

data. Rather than "check out" procedures, inexpensive xeroxing equipment eliminates the need to remove original materials from the system and solves the problem of un-retuned source material.

Improvement of the System. The evolution of the information system is something addressed throughout this section by an emphasis upon flexibility. In order to remain within manageable bounds, an active system will have to cull out seldom used materials, revise its filing procedures, redo its indexes and cross-references, cancel some subscriptions and try out others, and remain in frequent contact with primary data collectors around the city. Over time, certain basic data collection techniques will become routine, freeing time and money for new problems. The routine procedures should not be neglected, however, since good longitudinal data is a rarity even in today's highly quantitized environment. And finally, it should be constantly born in mind that data systems dealing only with numbers are much poorer in information content than those systems which attempt the storage of qualitative materials as well.

Staffing and Costs. Probably the single greatest cause of irrelevancy in information systems is the isolation of data collection from data use. This sweeping abstraction has very concrete implications for the staffing and funding of any information system. Rather than setting up a system manned by specialists in data collection, the isolation of collection and usage can be fought by requiring all staff members to participate in the activities of the information system and by refraining from hiring persons for exclusively information functions.

Of course, organization of files and contacting outside sources will absorb considerable time from each participant, so the overall result of increased data collection and use will be the need for additional planning staff. This need can be estimated directly by adding up the approximate time commitments expected from existing staff--i.e., 10% of 10 persons' time means one additional staff person should be hired. Administratively, this may sound impractical and utopian; but how else can a purposeful information system be constructed? As a concession to administrative difficulties, some staff could be assigned to as much as 50% information system duties, but there is no need for the 100% specialist. The only exception could perhaps be in the areas of clerical support,

although this too, could be parcelled out or rotated to increase the general awareness of how the system operates. In many organizations the combined experiences of the clerical staff is the information system; they do the filing and retrieval, the interviewing of new contacts, and the culling out of old unused materials.

Specific cost estimates depend upon the quantity of research to be supported by the system. To start with, perhaps an overall average of 10% of all staff time could be formally designated as information system activity (actually, DCP activities already include this function informally) and directed toward the tasks outlined above. The initial material support requirements are simple: a room equipped with shelves and filing cabinets, a xerox machine, card files, and clerical support. Locating the responsibility for development and use of this system to varying degrees with all staff simplifies greatly the problems of purposefulness, publicity, and periodic review and updating.

Definitions for Data Collection

Any given datum involves an entity and an attribute. The entity is that about which the statement is made and can be said to "possess" the attribute. Many attributes attempt to measure a quality of the entity. For example, a census tract (entity) has a member of persons (attribute) or a person (entity) has an age (attribute). These concepts are helpful in making decisions about data collection and data storage.

It is obviously impossible to collect and store a record of every attribute of every possible entity. Selections, therefore, must be made as to what items will be collected. Among the criteria according to which selection should be made are:

(1) Availability. There are varying degrees of difficulty in finding and collecting data. These difficulties may be related to such things as theory, cost, time, legal constraints, or moral constraints.

(2) Relevancy. Available data can be pared down considerably through clarification of the purposes and priorities which the data is to serve. Unavailable data can sometimes be generated, if its purpose is of high enough priority.

(3) Reliability. Although a given datum may be available and relevant, its usefulness can be diminished if it is subject to systematic biases in measurement. Reliability is normally a function of the collecting technique.

(4) Comparability. Many data are most useful in comparison with other data. But in order to be compared the units by which attributes are measured must be consistent. Comparison of the number of families in one census tract with the number of unrelated individuals in another would, for example, be relatively useless.

(5) Repeatability. Analytic studies depend upon clearly cited sources and carefully specified methodologies for their credibility. Although some methods cannot be repeated exactly (sample surveys, for example), explicitness about methodology and data help to elucidate differences which may occur when similar subjects are studied more than once.

After a selection is made of which data are to be collected, a system must be designed for storage and retrieval such that ease of retrieval can contribute to the usefulness of the data. The key to retrieval is the organization and indexing of data files.

Files. A data file can be thought of as a set of rows and columns arranged on a page. Down the left side of the page are the names of the entities, each one designating a row. Across the top are the names of attributes, each one designating a column. Each square including an attribute of an entity is a datum. If the page is cut horizontally and the data are filed by the name of the entity, the filing system is called horizontal. In this kind of file a user would look up the entity and would find data regarding all the listed attributes of that entity. If, on the other hand, the page is cut vertically and the data are filed by the names of the attribute, the filing system is called vertical. The user of this system looks up the attribute and finds data for that attribute of every entity listed.

The file organization is implemented using a storage medium. The particular medium used has a great deal to do with the ease or difficulty of retrieval and processing. These are several of the common media:

(1) Documents--Paper is usually the simplest and least expensive method of data storage. Almost all available data can be obtained on paper. Paper documents, however, consume large amounts of space and are difficult to centralize, transfer, update, and maintain. They also necessitate either hand processing or transfer to another medium.

(2) Microfilm--Film has the same processing problems as paper and is slightly more expensive, but it overcomes the storage space problem.

(3) Maps--Maps have the advantage of collecting and displaying large amounts of data in one place and facilitating pattern recognition. But they are awkward to store and handle and tend to deteriorate rapidly. In addition, their data are difficult to process.

(4) Punch card--Primarily a machine record form, punch cards are intermediate between hand and machine and can be processed by both. It is faster than hand but slower than other machine methods. The amount of data on one card is limited and large amounts of data require large, heavy card files. For this reason, most large punch card files are transformed to tape or disc.

(5) Computerized Means--Computer tapes can hold enormous volumes of data and programs can be run to cross-tabulate attributes if filing is done carefully. However, tapes are referenced serially which means the tape generally has to be read from beginning to end and records searched in the way they are strung together on the tape. Cost of computer storage and computer retrieval can be significant, and complicated programs for cross-tabulations can be even more expensive. The magnetic disc is similar to the tape except that the volume of its storage capacity is somewhat lower, and the speed with which particular data can be found is significantly faster.

An Example of Data Collection Activity

Proposals for a large, computerized, common information system have been made in the past, but have apparently not received sufficient support to warrant implementation. One example is the 1969 Department of City Planning report Achieving a Common Information System. Perhaps a less ambitious and thus less expensive proposal could win approval.

A basic "data bank" on the physical state of the city could be achieved using three items: the Department of City Planning Land Use Survey, the Central Permit Bureau's building and demolition permit file, and the Assessor's Office's Secured Assessment Roll. The following is the information included in those sources.

Land Use Survey-	location (block-lot) census tract uses by industry uses by facility type area (in acres) zoning classifications # of dwelling units
Permit File-	location (meets and bounds) type of structure date # of dwelling units construction (demolition) cost
Secured Assessment Roll-	location (block-lot) name of owner parcel address address to which tax bills are sent land value improvement value assessed value tax exemptions amount of taxes dates taxes were paid

In each of these files the entity is the parcel, but there is not a common name for the parcel. The simplest way to achieve a common name would be to add the assessor's block and lot numbers to the building and demolition permits. There would then be a total of 19 attributes among the three files for each entity.

The land use survey and assessment roll are already computerized. They could probably be programmed to print out combined data lot by lot and in block and tract summaries. If the suggested changes in the permit file were made, it could be transferred to computer tape and added to the lot information. Periodic print outs (once or twice a year) would indicate recent changes on the lot. If, in addition, lot and block numbers were added to permits issued since 1970 then all changes since completion of the land use survey could be included.

The Census of housing also lists block statistics for several data about housing and population characteristics. A "dictionary" could be made translating assessor's blocks into census blocks and cross tabulations of land-use-permit-assessor data with census data would be possible.

The basic operational principles illustrated by the above example are clear:

- (1) Make as much use as possible of existing data systems.
- (2) Cross-tabulate those existing data sources which have the same boundaries of information coverage.
- (3) Discover and implement simple changes in data collection formats to facilitate items 1 and 2 in the future (such as adding assessor's lot and block numbers to building permit files).

